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ABSTRACT

This teacher's guide for planning the elementary outdoor education curriculum focuses primarily, though not exclusively, on activities for sixth graders who participate in a three-day resident program at Camp Edwards. Over 150 activities are organized under the subject areas of natural science, language arts, social studies, mathematics, and music; ten topics under natural science include plant and animal study, geology, astronomy, winter survival, marshland ecology and water study, and contour map reading. Subject matter areas are generally integrated into natural science activities and treated as tools for study and reporting of experiences in the natural sciences. Each area of study contains--in addition to a wide variety of learning activities--a statement of major objectives, background information for the teacher, discovery questions for students, and activities to help assess the results of the camping experiences. Pre-camp, in-camp, and post-camp learning activities are described, many in detail. The mathematics section, for example, gives complete instructions for five methods of measuring the height of a tree and complete plans for constructing a clinometer, a trundle wheel, a sighting level, and a surveyor's level. An appendix contains student worksheets and a bibliography of 32 entries in outdoor education. (JH)

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Teacher's Guide to OUTDOOR EDUCATION GRADES K - 6

compiled
Summer, 1971

by

Peter Kemp
Larry Nemmers

for

Elgin Public Schools
District U-46
Elgin, Illinois

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ELGIN PUBLIC SCHOOLS

OUTDOOR EDUCATION

NOTES TO THE TEACHERS

The out-of-doors provides a unique setting for direct learning experiences. A natural environment should be used when it most effectively develops concepts in our curriculum. Ourdoor Education is learning in or about the outdoors.

The imagination of the teacher is the only limiting factor in the number of experiences that children may enjoy in regard to school curriculum. In this guide are indoor and outdoor activities to enhance the perspective of the teacher in Outdoor Education. It is not intended to be a prescription, but merely an incomplete group of selected activities from which you may use all, or a few. However many activities you use, incorporate your own methods and ideas with those suggested.

This guide is arranged by grade from kindergarten through sixth. The activities are grouped in subject areas taught at each level. Each unit within a subject area is subdivided into concepts which are developed through a variety of outdoor experiences. Apply these outdoor experiences to your current program, with some new methods, materials and ideas. Found at the end of this guide is a list of local resource people and places that you can also use. Our Instructional Materials Center Guide has numerous listings of applicable audio-visual materials.

We hope that the teacher and children in using these ideas grow in appreciation and wise use of their environment.

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Unit I - Motor Development

Concept A CHILDREN CAN LEARN TO USE AND UNDERSTAND THEIR BODY MOTIONS THROUGH OUTDOOR ACTIVITIES

Activities:

1. Do some of the animal walks outdoors. See page 35 of the EPS Kindergarten Guide. Walks such as bunny, ostrich, and kangaroo.
2. Do exercises to develop coordination, body concept, and motor skills; such as bicycle movement on back, skipping, skating movement and touching toes while sitting. All can be done outdoors. See page 38 of the EPS Kindergarten Guide for further ideas.

Unit I - Social and Emotional Growth

Concept A THE OUTDOORS PROVIDES OPPORTUNITIES FOR SOCIAL DEVELOPMENT

Activities:

1. Have children bring a toy to play with outdoors. During a play period, have the children share their toys with at least two other children.
2. Have children select a partner and play tag. All of the children must be holding the hand of their partner at all times. When either of the "teams" is tagged, the team is "IT". Naturally, you will want to play this and many other games and activities in the outdoors.

Unit I - Sensory Development

Concept A A CHILD BECOMES AWARE OF HIS ENVIRONMENT THROUGH HIS SENSES

Activities:

1. Go outside with the group to develop visual awareness of concepts like big, long, tall, green, dark, smooth, near, far and fast. Look for as many things that show these concepts while sitting in a small area of the school grounds.
2. Take your brood to an outdoor setting to listen to the sounds they can hear. Have the children sit quietly and raise their hands when they hear a sound. Have them describe it and try to determine what is making the sound. Sounds such as trains, planes, wind in trees, birds, frogs, or dogs may be in your environment. It is wonderful how children can hear and identify sounds.

Unit I - Science

Concept A LIVING THINGS ARE FUN TO FIND

Activities:

1. Take the group outdoors to look for homes of living things like spiders, birds, insects, worms or toads. Look near the building, around bushes, under things and at the roofline for various living things and where they live.
2. Place something sweet like sugar on a pan away from the school building but on the school grounds. After a day, take the class to the pan to watch which insects and animals use the sweet material for food.

Unit I - Language Arts

Concept A NATURE STIMULATES CHILDREN TO COMMUNICATE

Activities:

1. Go outdoors to have the children look for some living thing, plant or animal, that is moving. Have each child in turn imitate that motion while the other children guess what he is imitating.
2. While on the playground, have the children play follow the leader. The child chosen as leader makes a movement, and the other children do the same movement. The leader may simply tell the others what movement he wants them to make, like, "lift both hands toward the sky, or march forward or backward, or point at a tree". Each child can have an opportunity to lead the game at some time.

Unit I - Mathematics

Concept A NATURE PROVIDES MATERIALS THAT HELP DEVELOP MATHEMATICAL CONCEPTS

Activities:

1. Have children collect leaves, stones or twigs to be used as manipulative aids in teaching size relationships such as shortest, longest, biggest, smallest, numbers and first, second concepts.
2. Have children collect a given number such as one, two or three of things that are about the same size as something you show them. You might show them a bobby pin or a small ball. When they have found these objects, let them compare them with your object to see which are similar in size.

Unit I - Art

Concept A WINTER HAS ART ALL AROUND

Activities:

1. Just after a new snowfall, take the class out in it to make large or small size designs. They can use their feet, hands, fingers or whole body.
2. When the leaves have fallen from the trees, have the children go outdoors to look at the designs the bare branches make against the sky. Variety seems endless.
3. See the Kindergarten Guide, pages 92-98, for many fine activities that you can use out-of-doors.

Unit II - Music

Concept A MUSICAL ACTIVITIES CAN HELP US ENJOY THE OUTDOORS

Activities:

1. To the songs that have movements that go along with them, have the children go outdoors to perform the movements.
2. Have the children take a jump rope outdoors. Swing it back and forth at a given rhythm. Let each have his turn at jumping the rope at a given rhythm. Change to a different rhythm.

Unit III - Creative Dramatics

Concept A NATURE IS THE STAGE FOR DRAMATICS

Activities:

1. In an outdoor setting, have the children act out the parts to some familiar nursery rhymes and stories. The Little Red Hen, or Jack and Jill, or The Three Bears could be dramatized.
2. While watching the motions of people, animals and other moving things, have the children make motions and actions like the thing they are watching. They may try to move slowly or quickly depending on what they watch.

Unit I - The Five Senses

Concept A WE NEED LIGHT TO SEE

Activities:

1. Take children on a walk around the school, preferably in a wooded area. Observe the shapes of trees, footprints, bushes, clouds, leaves, and buildings. Observe different insects crawling on leaves. Discuss their special coloring. Does it protect them from their enemies? How? Observe design of veins of leaves, flowers, and butterflies.
2. Take the children to as many as possible of the following: traffic signal, a red exit sign, a red fire box, caution lanterns around a construction project, white lines representing street crossings, and parking areas. Discuss their meanings and uses.
3. Take a trip outdoors. Let the children practice differentiating things by their colors. Use pairs of things, similar except in color. Example: brown cat and black cat, green leaf and orange leaf. Isn't nature beautiful?
4. Take a trip outdoors. Discuss colors related to the seasons. Example: the pale green leaves in the Spring; the various colors of flowers, fruits, and vegetables in the Summer; the red and yellow of the leaves in the Fall; and the white snow of Winter.

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Unit I - The Five Senses

Concept B WE HEAR MANY DIFFERENT SOUNDS

Activities:

1. Take the children outside on the playground, have them close their eyes and remember all the sounds they hear.
2. Take children on a walk on pavement, grass, gravel, and leaves. Discuss, as you walk, how various ground coverings sound different when we walk on them. Which covering is the quietest?
3. Take the children to a wooded area. Tell them to pretend they are Indians and to keep real quiet. Now listen to nature sounds. Nature sings and talks, whistles and howls. Isn't this a lovely way to spend a few hours?
4. A few things to listen for:
   a. Animals - squirrels, crickets, flies, birds, dogs and frogs.
   b. Weather - trees moving, wind rustling leaves, and don't be afraid to get wet.
   c. People - mowing lawns, talking, children playing.
   d. Traffic - cars and trucks, horns, whistles, tractors, trains, and airplanes.

Unit I - The Five Senses

Concept C BY TOUCHING WE CAN FEEL HOT AND COLD, HARD AND SOFT, ROUGH AND SMOOTH, WET AND DRY, AND SHAPES AND SIZES.

Activities:

1. Take the children on a walk in the woods or playground. Let each child feel many objects. Encourage the children to use words such as rough, smooth, fuzzy, silky, hard, soft, hot, cold, warm, dry, damp, and wet.
2. Some objects to feel might be: pebbles, mud, dirt, bark, dandelion, bricks, breeze, thorns, pine cones, and warmth of sun.
3. Put familiar objects from the out-of-doors in a paper bag. Let the children reach in without looking and feel them.

   What is it?

Concept D EVERYTHING HAS ITS OWN SPECIAL SMELL

Activity:

1. Take children outside to smell; burning leaves, earth being plowed, ground after a shower on a hot day, tar being poured on a street or roof, flowers, freshly mowed grass, and bugs.

Concept E WE CAN TASTE BITTER, SWEET, SALTY, AND SOUR

Activity:

1. Harmless things that can be tasted outdoors: blackberries, dewberries, wild cherries, wood sorrel, sorghum, and sugar maple sap. Can air pollution be tasted?

Concept F WE USE ALL OF OUR SENSES TO EXPLORE THE WORLD AROUND US

Activity:

1. Have the children use all their senses to "discover" things on a walk through the woods (parks), or on the playground. Then have them describe what they saw, heard, felt, smelled, and tasted. Be careful!

Unit II - Living Things

Concept A ALL ANIMALS NEED FOOD, WATER, AND HOMES

Activities:

1. Have the children observe various types of homes. Examples: bird's nest, chicken coops, dens, barns, etc.
2. Have children take a bird's nest apart to see what it is made of. Sort the materials - twigs, mud, thread, cloth, etc. Count the pieces to see how many trips the bird must have made. A magnifying glass will show parts of the nest better.
3. Have the children plant a bird's nest. Did anything grow? What might the bird have picked up to build the nest?
4. On a nature walk have children look for animal homes in holes in the ground, under rocks, under bark, etc. What kinds of animals live in trees, on the ground, etc.? Why did they choose that place to live? Observe birds in the fall then watch to see which ones leave and which stay. Why? Where do some go?
5. Take children on a walk to find an earthworm. Keep the earthworm in a jar filled with moist, dark, loose soil. Cover the jar with a dark paper that can be removed for observation.

Concept B ANIMAL TRAVEL IN SEVERAL DIFFERENT WAYS

Activities:

1. Have the class observe a fish as it swims.
2. On a nature walk, encourage children to find frogs, grasshoppers and toads and watch them hop.
3. Let the class observe an earthworm as h moves.
4. On a nature walk, have children observe birds in flight and on the ground. Discuss their different wing positions in flight (flapping, gliding).

Concept C ANIMALS HAVE DIFFERENT KINDS OF COVERING

1. Take a field trip to observe various types of animal coverings (feathers, hair, fur, etc.).

Concept D PLANTS DIFFER IN COLOR, SIZE, TEXTURE, SHAPE, AND LEAVES

Activities:

1. Have children plant a variety of seeds to show that plants differ as the seeds differ. What are some of these differences?
2. Take the children on a nature walk. Have them observe the differences in plants that they see. How many differences are there?
3. Gather a variety of leaves and seeds to show differences in size, shape and color.
4. Gather stems and roots and compare differences.

Concept E TREES AND OTHER PLANTS PROVIDE HOMES FOR INSECTS AND OTHER ANIMALS

Activities:

1. Take the class on a nature walk to find animal homes (Activity 1, Concept A of this unit). Where were these homes found? Example: birdnest, squirrel nest, a cocoon, wasp nests, webs, etc.

Unit I - Children are Social Individuals

Concept A EACH CHILD IN THE CLASSROOM HAS SIMILARITIES AND DIFFERENCES

Activities:

1. Take the children outside and have them discuss the differences and similarities between two plants, two animals. Relate this to the children. Do all of the children have similarities? Differences?
2. Play charades outside. Have the children depict things in nature like storms, food chain, animals, etc. What makes them happy, sad, angry, etc.?
3. Shadow activities - see pages 17 and 18 in the Primary Science Guide EPS.
4. Have a "culture hunt". Let each child bring an object; pictures, tools, etc. from his cultural past. Maybe each child could tell a little story about the item(s) they bring. This lets each child find out a little about the others' cultural heritage.

Concept B PEOPLE NEED TO LEARN AND COMMUNICATE WITH ONE ANOTHER

Activities:

1. Visit a farm or zoo. What do we learn about while visiting these places? Where did the farmer, zookeeper learn how to care for the animals?
2. It should be pointed out that mothers, fathers, teachers,

etc. all enter into the learning process of the child. Review - "The Five Senses", pages 1 to 10 in the Primary Science Guide to point out that many things are learned by one's self.

3. Have a child try to communicate a nature event. Example: a growing plant, mother bird feeding babies, etc.
4. Get some animal sounds on record or use tape obtained from the music unit in Concept A, Activity 1, grade 5. Let each child tell what he thinks the birds are trying to say. Do animals communicate?
5. See Social Studies Guide, Grade 1, Activity 12 on page 13.
6. See Concepts in Science, Grade 4, p. 19.

Unit II - School

Concept A A SCHOOL PLANT IS MADE UP OF BUILDINGS AND GROUNDS

Activities:

1. Take the children on a walk to observe the school and school grounds. Draw a "map" of this area.
2. Have the children observe the school building. Discuss the color, size, structure, etc. Discuss the materials from which it is made.
3. Take class on a walk and observe where the utilities come into the school. Discuss.

Concept B MANY PEOPLE HELP US AT SCHOOL

Activities:

1. Have the children visit and interview different people who help us at school (e.g. teachers, custodians, cafeteria personnel).
2. Let the children amke up a story (draw pictures) about the school personnel and how they are related to outdoor activities. Example: cafeteria personnel - food.

Unit I - Vocabulary

Concept A STIMULATION OF THE SENSES DEVELOPS VOCABULARY

Activities:

1. Develop the skill to listen by taking the class on a trip outdoors. Let the group stand with eyes and fists closed. Open fists, one finger at a time, as sounds are heard.
2. On a listening trip, pause for children to describe sounds as follows: a certain bird call, chirp of a cricket, hum of a bee, feet on dried leaves.
3. Have the children watch ripple of waves, movement of trees, birds, insects, and animals.
4. Have each child sit on a small section of ground and focus on one sense or one thing at a time, such as a blade of grass, a bud, a spider (or web). Ask each child to tell something about each thing he observed. They can look, touch, smell, taste what they are observing. Use a tape recorder. Put the words on the board and use in a story.
5. Have an "alphabet scavenger hunt". Each child or group is to find a series of natural objects chosen so that for each letter of the alphabet there will be an object whose name (or part of it) begins with that letter. Select five or ten letters if you wish to simplify this game.

Concept B NEW WORDS ARE LEARNED THROUGH OUTDOOR EXPERIENCE

Activities:

1. Take children on a nature hike for the purpose of increasing nature vocabulary.
2. Return to classroom and make experience charts. List experiences and words used. Example: bark, stump, feathers.
3. Have children learn words to describe nature sounds. Use terms like chirp, buzz and bark.
4. Have children make one-sentence descriptions of experiences on nature hikes.
5. See Grade 1, Science, Unit I, Concept A, Activity 1.
6. See Grade 1, Mathematics, Unit 1, Concept A, Activity 4.

Unit I - Comparison

Concept A MANY EXAMPLES OF NUMBER AND SIZE CONCEPTS MAY BE FOUND IN NATURE

Activities:

1. Have children collect sticks or rocks and arrange in order according to size, starting with the shortest and ending with the longest.
2. Have children pick up a given number of rocks, leaves, or sticks such as five or seven - then write the numeral in the dirt or sand with a stick.
3. Combine direction and numbers by having the children take two steps forward, four steps to the right, six steps to the left, and five steps backward. "Captain, May I" could be played here.
4. Use the school grounds to explain mathematical word meanings.
    a. The building is high.
    b. Is the airplane higher?
    c. Which is highest - a tree, a bird, a building or a plane?
    d. Is the sidewalk high or low?
    e. Is the flower lower than the tree?
    f. Which is lowest - the tree, a fence, a bike or the grass?

Use words like large, small, heavy, light, near and far.

5. Have children count all the things you can see on the school grounds. Then take a stick and write on the ground the numbers for each set. After counting, classify according to sets. Example: trees, buildings, cars, etc.
6. Have the children go outside to compare the size of objects. Use terms such as larger, smaller, shorter, taller, etc. In counting a sampling of leaves, the terms more than and less than are used.
7. "Connect the Dot" activities in the Addison-Wesley text have many outdoor animals and scenes.

Concept B THINGS MAY BE MEASURED OUTDOORS

Activities:

1. Have children measure the length of shadows at different times of the day.
2. After the children have become familiar with the terms inch and foot, they can go outside and measure some of the following:
    a. length of the shadow of a stick
    b. width of the sidewalk
    c. length of leaves
    d. height of various plants
    e. learn personal measurements to use as estimates. Examples: hand span, height, pace, width of stretched out arms

3. Take children out for a walk. Let them estimate how long it took to go and return.

4. Take class outside. Let one child take a quart measure and bring it full of dirt and pour in a pile. Let another child (or two) bring a gallon of dirt and pour it in another pile. Discuss which is the largest pile of dirt. Let the first child continue to bring another quart measure of dirt until four measures have been poured in this pile.

Unit I - Designs and Shapes

Concept A MANY DESIGNS AND SHAPES CAN BE FOUND IN NATURE

Activities:

1. Go outside and look at the shapes of trees. Have the children make pictures to show what they have learned about tree shapes. Trees and other landscape features may be cut or torn from colored paper. All can be pasted on light blue or green construction paper to form a pleasing picture.
2. Designs in nature can be found in other objects such as the sun-circle, rocks-circle, the sky-semi-circle, acorn-oval, building-square and rectangle, flag- rectangle and housetops-triangular. Ask student to sketch these designs.
3. Have children gather leaves and make leaf prints with crayons.
4. Have the class observe the different shapes of clouds. Draw these shapes while outside.
5. Let the children look at the different shape of bark on trees.
6. Let children gather sticks, twigs, or leaves which may be glued or taped to cardboard or construction paper in the shape of trees, animals or people.
7. Have children collect rocks of different shapes. Return

to classroom and wash rocks. When rocks have dried, paint with tempera to make cars, bugs, turtles, etc. Add a few drops of glue to tempera to give it a gloss or sheen.

Concept B DIFFERENT COLORS APPEAR EVERYWHERE IN NATURE

Activities:

1. Take the children for a walk in the fall to observe the different colors of nature, especially the leaves. Have them draw leaves and color them different colors as observed while walking.
2. On a nature hike, have children take white art paper. Collect different colored petals, leaves, and berries. Crush them to use for "paint brushes". "Paint" a picture.
3. Take the children on a "color" walk. One person looks for as many objects as possible that are red. Another chooses blue, another green, etc. A variation of this is to have everyone go on a "blue" walk one day, a "yellow" walk another day, and a "red" walk still another day.

Unit I - Patterns

Concept A PATTERNS OF MUSIC ARE OUTDOORS

Activities:

1. Take the children to hear sounds of music. Have children close their eyes and listen, raise their hands if they hear a sound of music; such as birds singing, crickets chirping, cows mooing, bees buzzing, and water rippling. Schools located near town or on a busy street might hear cars, trucks, planes and whistles. See Language Arts, Concept A, Activity 1.
2. Many natural objects can be gathered on a nature walk and used directly or adapted for use as instruments. Pebbles, sticks, locust seedpods, gourds, acorn cups, rocks and dried grass are among objects that children can collect to prepare for making instruments for a rhythm or musical band.
3. Use correlated pictures of birds and records of bird calls to teach recognition. Then take the class outdoors to see how many birds and bird calls they can recognize.

Unit I - Safety

Concept A BY USING GOOD SAFETY PRACTICES ONE CAN LEARN MUCH ABOUT SAFETY OUTDOORS

Activities:

1. Take the children on a safety walk around the school grounds and building. Discuss the different safety signs and why we should obey them. Examples: stop sign, blinking red and green lights, no running signs, no parking, school zone and speed limit.
2. Have children practice going to and boarding buses in an orderly way.
3. Discuss the way to cross a street. Then let them practice this outside.
4. Fire Drill. Discuss the responsibility of each child when he hears the fire signal. Example: windows, doors, walking, etc.
5. Invite a policeman and bus driver to talk about school safety.

Unit II - Games

Concept A - OUTDOOR GAMES PROVIDE FUN

Activities:

1. Go on a treasure hunt. Give small groups of children a short list of things to find, such as: a leaf, two twigs, a pine cone, pebble, large rock, etc. The first group to return wins. Make sure you, as the teacher, have combed the area so things on the list are available.
2. "Drop the Handkerchief" is a fun game using a pine cone or willow branch.
3. Have a relay using a leaf. Give each team a different kind of leaf. Team names might be: The Maples, The Oaks, The Elms, etc.
4. "Gold Strike" -- pebbles and stones are painted or sprayed yellow (let the children do this). Then the teacher hides the painted rocks in the school yard. The child that brings back the heaviest pile wins.
5. Collect six flat rocks. Number them on one side only. Divide the class into two groups each with their own set of rocks. Players take turns throwing all of the rocks. If they land number up in a designated area, the player gets that many points. The points are added, and the player with the most points wins. Also, the team with the most points wins.

Unit I - Plants

Concept A PLANTS ARE DIFFERENT IN MANY WAYS

Activities:

1. Go outside and see a variety of plants. Help each child to discover many differences in plants - large, small, with leaves, broad leaves, narrow leaves.
2. Have children collect a variety of plants to press and place under clear plastic for display on a bulletin board.
3. Discuss homes of various plants before and after field walk. Note factors such as shade, dryness, cold, or heat. Find pictures of examples.
4. Put a piece of moistened bread in a sealed jar. Observe for several days, the mold growth.

Concept B PLANTS NEED SUN, WATER, AND GOOD SOIL TO LIVE AND GROW

Activities:

1. Plant seeds, such as beans or peas, in three containers. Put one in the sunlight but do not water it. Place another in a dark place, but water it. Give both sunlight and water to the third. Observe the results daily, after germination. Direct children to explain any differences. When we plant things we need to give them tender loving care.

2. Cover a grass area with an opaque object, such as a board, for two weeks. Observe the result and direct discussion towards discovering cause and effect.
3. Plant flower bulbs, such as tulips, daffodils, iris, in the fall for spring flowering. Observe and record growth and change. Encourage home projects.
4. Go with the class to a greenhouse or nursery. Have children find out why we have them, and what the plants are used for. What is the greenhouse for trees?

Concept C PLANTS ARE USED IN MANY WAYS

Activities:

1. Take a trip to a woods, garden, field, or in the neighborhood to find plants that provide us food, clothing, shelter, or fuel. Display some that children bring in.
2. Make charcoal by carefully charring small pieces of hardwood. Use this for art, or as part of a terrarium.
3. Discuss other uses of plants such as for decoration, medicines, and paper. We need to be sure people in the future may have them to use.

Concept D TREES HAVE MANY IMPORTANT PARTS AND DIFFER IN MANY WAYS

Activites:

1. Collect various leaves with children. Compare sizes, shapes, colors, edges and stems.
2. Adopt a "class tree". Observe carefully, changes through-

out the school year.

3. Compare through careful examination several trees to identify how parts are alike (bark, leaves, twigs roots, trunk, size) and the differences in the same parts. Children may want to draw parts or overall shapes.
4. Make a clue chart for tree identification.

Shape	Leaves	Bark	Branching	Fruit	Flower	Name
(General)	(shape)	(ridged,	(buds)	(ripe)	(color)	(location)
(Branches)	(simple or	smooth)	(shape)	(use)	(size)	(uses)
slender,	compound)	(color)	(scars)	(date)	(date)	(relatives)
stocky, few	(edge, color)		(color)			

A sketch may be made of each clue to identification.

Unit II - Soil

Concept A SOIL IS MADE OF MANY THINGS

Activities:

1. While taking a walk, help children collect soil samples from various places. As they examine these with a hand lens, have children record observations of what the soils are made from (dead plants or animals, rock particles) for each sample.
2. To show how larger particles may be separated from the soil, have a child pour a sample of soil through a strainer over a large pail. Let another child pour water through it several times. Observe and discuss what went through the strainer and what is left and why.
3. After filling a jar about half way with soil, add water above the level of the soil. Have children observe the top of the water for a couple of minutes to see bubbles rising. Lead them to discover that soil contains air. Air is necessary for the very existence of all life.
4. When your soil samples are dry, try burning them to obtain different odors. Different materials when burned will release various odors.
5. Go to a nearby farm to see how farmers make the soil good for growing (fertilizing, plowing, planting).

Have the farmer tell of the importance of good soil.

6. Let the children help make a school garden by preparing soil, planting seeds, fertilizing, and watering. Fertilizers to plants, are like vitamins to people.
7. During a walk, locate examples of erosion. Lead discussion towards what? and why? (Motion of wind and water). Follow up with experiments by pouring equal amounts of water over equal amounts of different soils (including sod) in like containers to see how water affects each somewhat differently. The grass on the sod holds the particles together well, due to the roots, thus preventing much potential erosion.

Unit III - Earth, Sun, and Moon

Concept A AS THE MOON MOVES AROUND THE EARTH ITS SHAPE AND POSITION APPEAR TO CHANGE, AND SURFACE FEATURES CAN BE SEEN

Activities:

1. Observe the moon after the last quarter when it can be seen in the morning. (While observing the moon be careful that none of the children turn binoculars toward the sun. Serious permanent damage to the retina of the eye can result).
2. Have the children make craters: standing on a ladder above a sandpile, throw a ball into the sand as hard as you can. This forms a "crater" - dropping smaller objects such as marbles will form small craters. After several have done this, note the variations in size and depth.
3. Throwing a rock into moist sand or mud will create a crater-like depression.
4. Explain and discuss the moon's motion and that it receives light from the sun.
5. Have the children observe and record temperature differences outside in the shade and in the sun. Discuss the reason for the differences and the source of heat.
6. Have children place thermometers on school grounds in different locations. Take readings at different times of the day for several days and record each on a simple

graph to show the day, time, place and temperature. Compare the graphs and discuss causes of the differences. (Earth moves, clouds, weather conditions, error?) It is good to plan some of the things we do as we understand how temperatures change.

7. Have children measure the length of the shadow of the flagpole, other poles, or child's shadow at different times of the day. Discover why this length changes.
8. Have four children make a circle facing out. Early morning or late afternoon will get best results. The child facing the sun receives more light on his face than the child on the other side of the circle. Now have the children pretend they are the earth turning on its axis. As they turn, each one will face the sun and be in the brighter light at times. If your four children were the world turning, no light could filter through to the dark side; therefore, that side of the earth would be dark. If you let another child be the moon, he could move around the four children always facing the earth. Thus children could discover how one side of the moon is always light, the other dark, but we do not always see the light part of the moon, but we can see all of the light side sometimes. Continue discussing day and night with children. Then go to the classroom to demonstrate with a globe and flashlight in a darkened room to reinforce the ideas.

Unit IV - Weather

Concept A WEATHER CHANGES AS THE CONDITION OF AIR CHANGES

Activities:

1. Blow up a balloon in a warm room. Have children take it out into the cold. Note change and assist children to discover that the air shrinks when it gets cold.
2. On the playground, let children note effect of the wind. (On trees, grass, clothing).

Concept B WIND IS CAUSED BY MANY FACTORS

Activities:

1. Make an anemometer (wind gauge). Staple the handles of four paper hot cups to a circle of cardboard (paper plate or tag board). The cups are placed facing the same direction. Balance the cardboard on a sturdy upright stick, with a pin in top (head up), so that it will turn freely. Place the anemometer in the wind and count the revolutions in varying winds.
2. Put a small cotton rope, smoldering at one end, in a jar. When the jar is filled with smoke, remove the rope and put a sheet of paper over the mouth of the jar to hold in the smoke. Heat the jar. Bring another jar in from a cold place (refrigerator). Put the jars mouth to mouth, the hot jar with smoke on the bottom. Remove the paper. What happens? Why? (Cold air is

heavy, and hot air is light, and the heaviest will fall to the bottom.)

Concept C RAIN IS CAUSED BY SEVERAL FACTORS

Activities:

1. Have children put the same amount of water in two or more identical shallow pans. Put some in the shade and some in the sun. Several hours, and days, later, measure the water carefully. Did the same amount of evaporation take place? Explain and discuss evaporation and various places on earth where it takes place. (Ponds, lakes, rivers, oceans, seas, plants).
2. On a cold day, lead children to understand that their breathing makes small clouds of moist air.
3. Outdoors, when it is snowing, collect snowflakes on a dark sheet of paper and examine them with a hand lens. Watch the snow as it melts to see how much liquid water is left. Assist them to discover less liquid water is left than the volume of the snow, after it melts.
4. Heat a dish of water to boil to see steam form small clouds. Allow some steam to form droplets of water on a piece of glass at room temperature. What is happening? Why? (Hot, gaseous water when cooled, returns to liquid.)

Unit I - Community Helpers

Concept A MANY PEOPLE SERVE OUR COMMUNITY

Activities:

1. During a walk around the school and its neighborhood, observe as many helpers as possible. (Many birds, insects and animals are also helpers).
2. Make a classroom movie or picture story of field trips to the local police, post office, fire station and grocery store.
3. See EPS Social Studies Guide for grades 1, 2 and 3, page 37.

Unit II - Transportation

Concept A MANY KINDS OF TRANSPORTATION ARE NEEDED TO DO THE WORLD'S WORK

Activities:

1. Take a field trip to an airport, a bus station, a train station or a truck transfer company. Then discuss the importance of each type and why we need each type.
2. Make a mural to show the types of transportation used to move people, animals, land or other natural resources.

Unit III - Food

C
Concept A FOOD AND WATER ARE ESSENTIAL TO GOOD HEALTH AND GROWTH

Activities:

1. Visit gardens and observe fruit and nut trees to note the development of various foods.
2. Have children make a small scale water filter. Observe sediment from the water. Perform the following experiment. Place a fine screen over the bottom of a plastic cylinder. Place layers of sand, charcoal and gravel in the cylinder. Pour in muddy water. Collect the water as it flows out the bottom, and compare it with the muddy water.
3. Various field trips could develop the concept. Visits to a cattle pasture or feeder lot, dairy, grocery store, meat butchering shop, or water purification plant are suggested possibilities.
4. See EPS Social Studies Guide for Grades 1, 2 and 3, page 29.

Unit IV - Homes

Concept A THERE ARE MANY DIFFERENT TYPES OF HOMES

Activities:

1. Visit the community to observe as many different types of homes as possible.
2. Have children make a model community to show different types of homes.

Concept B THERE ARE MANY KINDS OF MATERIALS USED IN CONSTRUCTING HOMES

Activities:

1. Visit the community to observe many different kinds of materials used in constructing homes.
2. Visit a lumber company to observe building materials.
3. Display samples of building materials.
4. See EPS Social Studies Guide for Grades 1, 2 and 3, page 34.

Unit I - Oral and Written Language

Concept A <u>OUTDOOR ACTIVITIES CAN HELP ONE LEARN TO EXPRESS HIMSELF ORALLY AND IN WRITING</u>

Activities:

1. Go out on the school grounds. Sit quietly and listen. Write about the sounds you hear. (Poems, riddles, stories and sentences.)
2. Go out on the school grounds and play the game, "My Grandmother went on a trip and she took with her _____." The things that she took with her are things that can be seen from the school yard. A child will not be out of the game if he missed his turn. Have him stand for one mistake, one hand on hip for two mistakes, etc. (This game teaches A,B,C order.)
3. For your outdoor trips, have each child make a list of things he will observe.
4. Oral reports after field trips provide opportunities for creative oral expression.
5. Have children write thank-you notes to places that you visited.

Unit I - Applying Mathematics

Concept A MATHEMATICS IS RELATED TO EVERYDAY LIVING

Activities:

1. Have children measure various things and distances outdoors.
2. Measure indoor and outdoor temperatures in different times and compare.
3. Discover the growth rate of plants by measuring, at intervals, those outdoors or those you plant.
4. Go out on the playground. Develop the concept of a line segment by naming points and line segments.
5. Develop the concept of a circle by using a large circle of children. Place a child in the circle to show a point inside the circle then outside the circle. (Do the same with squares and triangles.)
6. Go for a walk. Record the time. Figure how long it took.

Unit I - Nature's Art

Concept A <u>OUR ENVIRONMENT HAS MANY FORMS OF DESIGN AND NATURAL MATERIALS THAT CAN BE USED IN ARTS AND CRAFTS</u>

Activities:

1. Look outdoors for interesting subjects for pictures.
2. Have children find natural designs outdoors; circles straight lines, zigzag lines, wavy lines.
3. As you take a walk with the children, observe as many colors as you can, not forgetting that different seasons bring out different colors.
4. Gather leaves for leaf prints.
5. Gather seeds, leaves, pods, weeds, stones and grass to make pictures of scenes, animals, plants or any choice of the child. Remember good conservation practices in selecting and using living materials.
6. Have children make flower pots from clay. Take a ball of clay, press thumb in the center and turn until the hole is desired size. Finish sides and edges, then let dry. Have fired in kiln. Paint and let dry again. Spray with clear plastic coating. Fill with soil, plant seeds.
7. Make spatter prints. Cover the work area with newspaper. Lay the paper to be spattered on the top of the newspaper. (Leaf print will be more successful if the leaf has been pressed overnight.) Have poster paint prepared

to the consistency of thin cream. Put your leaf on the paper, over this, place a frame covered with screen wire. Dip an old toothbrush over the screen wire frame (do not press too hard). The paint will spatter all around the leaf. Remove the leaf very carefully and let dry. Mount and display.

Unit I - Music

Concept A MUSIC IN THE OUTDOORS WILL DEVELOP A FEELING FOR AN UNDERSTANDING OF RHYTHM

Activities:

1. Go outside and listen to the sounds of the birds, and other sounds of nature.
2. Sing together outdoors.
3. Play musical games such as London Bridge outside.
4. Have children try to make similar sounds to those they hear in nature.

Unit I - Healthful Physical Activities

Concept A PHYSICAL EDUCATION PROVIDES WHOLESOME MENTAL ATTITUDES, HEALTHFUL HABITS AND MEANINGFUL USE OF LEISURE TIME

Activities:

1. Tree tag: one or more persons are "it" - players are safe only when they are touching a tree of a designated particular kind. Change the kind of tree from time to time. (This game should be played after children learn tree families.)
2. Observation: Each child is given a list of things to look for on a hike, perhaps with questions. They should check items that were seen and discuss them when they return.
3. Let-them-alone-hunt: the children divide into small groups. Each group gets a list of objects common to the area that might be seen on the hunt. Possible items might be:

sumac tree	a red flower
bird's nest	animal tract
red ants	fern
black ants	moss
poison ivy	mushroom

The hunters go together as a group. As soon as a player spots one of the objects on the list, he tells a group

leader and his group gets credit. Each object counts one point. Now other people can still enjoy those objects.

4. Dog catcher: name three or four kinds of dogs. Each child chooses what kind of dog he wants to be. All go to one kennel (one side of the play area). Dog catcher calls one kind of a dog. They run to the opposite kennel. If caught, they are put in the pound. After the dog catcher has had three turns, he tells how many dogs he has caught. Then he chooses another to take his place until all are caught. The last one caught starts the new game as catcher.

5. What am I? A player leaves the room, and the group decides what animal or other nature object he shall represent. The player returns and tries to discover what he represents by asking questions on characteristics that may be answered "yes" or "no". When he identifies himself, the person whose answers helped him make the discovery leaves the room next.
   Variations: The player writes on a slip of paper what he represents. The group may then ask him questions which can be answered "yes" or "no" until they find out what the student represents.

Grade 3
Science
Unit I

Unit I - Seasons

Concept A SEASONS BRING CHANGES IN TEMPERATURE

Activities:

1. Set up a thermometer outdoors. Have children make readings at different seasons for several days. Discuss why clothes we wear outside in the spring, winter and fall will vary.
2. From temperature readings, make simple graphs, plotting the daily readings. Is there a trend? How does this help people make plans for what they can do at various times of the year?

Concept B SEASONS BRING CHANGES IN PLANTS

Activities:

1. Have children select an area in the school yard and observe plants growing in the fall. Watch the change of this area as winter sets in, and then as spring begins. Do this as an overall observation and also block off areas and assign children to each for closer observation.
2. Have children observe a tree the entire year.
    a. Notice that buds are formed before leaves fall so it is ready to begin growth in the spring.

b. Mark an end (terminal) bud and a side (lateral) bud with twisters.

c. Observe buds in winter.

d. Observe buds more frequently in the spring. Notice terminal buds open to add length to the twigs. Lateral buds open to make a new twig.

e. Notice that some buds on a maple tree are neither lateral nor terminal. They are larger or different in position. Discover what they are through several visits. (Flower buds.)

f. Observe catkins (downy, tassel-like spike) on oak, hickory and willow trees. Also observe other flowers. Notice as seeds develop, and discover how seeds might be scattered. Develop understanding of the plant cycle.

Concept C SEASONS BRING CHANGES IN ANIMALS

Activities:

1. Have children observe changes in animals coats. Use their pets or keep small animals in the classroom at various times.
2. Have children find, or study about, dens and homes of hibernating and dormant animals. Discuss his preparation for hibernation such as eating in excess to store fat for the winter. Also the animal's body functions become slower.

3. Observe birds that are here at different times of the year.

    a. Build a bird feeding station.

    b. Keep records of birds using the feeder.

    c. Observe when certain birds disappear and when some are seen for the first time.

Unit II - Wild Animals In Our Environment

Concept A ANIMALS ARE HELPFUL TO MAN

Activities:

1. Have the children observe insect cross-pollinating plants. Allow them to taste the nectar and feel the pollen from the honeysuckle!
2. Find out about the black snake and how it helps the farmer. It eats mice that would eat his grain. A farm nearby might have black snakes.
3. Have children observe a beehive and honey. Let the children taste the honey.

Concept B SOME ANIMALS ARE HARMFUL TO MAN

Activities:

1. Show a piece of lumber damaged by termites, or a piece of wool eaten by moths.
2. Have children collect samples of leaves and twigs partially eaten by insects.
3. Have children make reports on different animals that bite or sting. Discuss cure and prevention.

Concept C ANIMALS PROTECT THEMSELVES IN MANY WAYS

Activities:

1. While on a nature walk, notice how animals scurry or fly away at your approach.

2. To show how some animals build homes to protect themselves and their young, take apart an old abandoned wasp's nest or beehive and have children examine how it was made and used.
3. Some animals are protected by their coloring (camouflage). Observe a praying mantis or a toad to see how the body can blend with its environment. Nature protects itself. Do we?
4. Observe, discuss and make various animal homes like holes, hollow trees, nests, under brush and around buildings to see how they are protected from weather and other enemies.
5. A mural can be a great project to show what the children have learned about animals protecting themselves.

Concept D WE DO MANY THINGS TO PRESERVE OUR WILDLIFE

Activities:

1. Take a field trip to a park, forest preserve or wildlife and nature center to learn about how trees and wildlife are preserved. Isn't it a good idea to keep things alive to visit them?
2. Have children provide winter feeding stations for birds and animals at school and at home.
3. Have children observe a stream of water and talk about why it contains impurities. Observe water samples under hand lenses and microscopes. Discuss how water purifies itself.

4. Have a game warden or veterinarian come to talk to the class on care for animals in captivity.

Concept E WILD ANIMALS DIFFER IN MANY WAYS

Activities:

1. With a string, mark off a square foot of soil in different areas. Have children count and compare the number of different insects found.
2. Have children make a bird survey. See how many different kinds of birds live in an area. Try to identify them from prepared bird charts (color, shape, size, song).
3. With the class, make a plaster cast of animal tracks around a pond. Compare these tracks with those of other animals in the area.

Concept F SOME ANIMALS HATCH FROM EGGS AND CHANGE IN GROWTH

Activities:

1. Take a field trip to collect caterpillars or cocoons to be observed in the classroom. Put into clear jar with ventilation.
2. Find a spider and compare it to an insect. Notice the general characteristics of insects and how they are different from the spider. Look for an egg sac.
3. Have children observe plant galls and the insects that produce them. Cut open galls to see insect eggs or larvae.

4. Let the children collect frog eggs and observe them as the tadpoles hatch. The changes which take place as they grow and develop could be recorded on a chart.

Unit III - Plants

Concept A MOST PLANTS HAVE SIX MAIN PARTS: ROOTS STEMS, LEAVES, FLOWERS, FRUITS AND SEEDS

Activities:

1. Plan a hike just to observe the six main parts of a plant.
2. Look for designs in the six main parts of plants. The circle--berries, seeds. Zigzag in leaf edges. Straight lines--stems, veins.
3. Dissect a flower to show the parts. Have children feel the pollen with their fingers. Compare the parts to a diagram of a flower.
4. Make a collection of fruits and identify each tree from its fruit.
5. Place a sweet potato in a glass of water. Place this in sunlight and in a few weeks observe the roots and foliage growing from the potato.
6. Partly fill a glass jar with water. Sprinkle grass seed on the surface of the water. Place the jar in a warm place, being careful not to shake the jar or the seeds will sink. After germination in about two weeks, grass appears from the top of the seeds and roots from the bottom. Have children examine the root hairs near the tip of the root with a magnifying glass.

Concept B ALL GREEN PLANTS TRANSPORT WATER AND MINERALS WHICH ARE NECESSARY FOR FOOD MAKING

Activities:

1. Using several plants that are alike, fertilize each with different amounts of fertilizer. Have students observe results.
2. Place several grown plants of the same size in loam, humus, moist clay, tap water, rain water, and sand. Have the class check the condition of the plants regularly and record their progress.
3. Put a stalk of celery in a glass of colored water to show how the trunk is used as a pipeline to carry minerals and water to the leaves for food making.
4. Using two potted plants, have class observe what will happen when one plant is watered regularly and one is not.
5. Make the iodine test for starch on seeds. With an eyedropper, put iodine on sliced seeds. If it turns purple, starch is present indicating there is stored food in the seed. See Concepts In Science, Grade 5, pages 234, 235 for illustrated investigation.

Concept C ALL GREEN PLANTS NEED SUNLIGHT, AIR AND PROPER TEMPERATURES

Activities:

1. On an outdoor walk, note plants damaged by too much sun, heat or too little light.

2. Plant some bean seeds in a box and grass seed in another. Place both boxes in a sunny spot and water them regularly. Let the children observe the plants growing toward the sun. Turn the boxes in the opposite direction and observe for a day or two. Put a lid on each box and cut a hole at one end of the lid. After a few days, observe the plants as they strive to reach sunlight.

Concept D PLANTS GIVE US MANY THINGS

Activities:

1. Have class examine a telephone pole carefully. Discuss what types of tree it might have come from.
2. Look for plants that are edible. Display in an exhibit, the plants and foods derived from them. Use foods of many kinds, including berries, vegetables, fruits, drinks, salads.
3. Don't hesitate to refer to Grade 2 activities in Science, Unit I, Concept C in this handbook. Your use will help to reinforce the concepts developed earlier.

Concept E PLANTS VARY IN THEIR MAKE-UP AND STRUCTURE

Activities:

1. Examine different leaves and flowers and record what the differences are.
2. Describe the differences between trees and bushes or shrubs. Do the same for flowers and weeds. Green and

non-green plants. Why are these types different? Are their purposes different?

3. With a safety razor blade, take the thinnest possible shavings from freshly cut pieces of cork, tomato, apple, celery and pear and look at them under a microscope.

Concept F PLANTS ARE SPREAD BY DIFFERENT MEANS

Activities:

1. Tie a string to a piece of woolen cloth. Have children walk through an open field, during the fall, dragging the cloth behind them. Examine the "sticker" seeds that collect on the cloth. Some seeds steal rides. Try to identify the seeds.
2. Have children collect different seeds that have wings, sails, no sails, and hooks. Test the seeds to see how they move best by blowing, dropping, and putting on water some of each kind. Many plants produce many seeds that will never get a chance to grow.

Concept G PLANTS ARE REPRODUCED IN VARIOUS WAYS

Activities:

1. Let the class collect twigs with buds (pussy willow, forsythia) and place in jars of water in a sunny place. Watch the roots appear at the bottom of the twig. After the roots have a good start, let the children plant them in the soil and watch the plants continue to grow.

2. Have children experiment by placing twigs or leaves of growing plants in water or soil to grow a new plant.
3. Plant several corn or bean seeds in a box. Dig one up each day and examine to note change.
4. Place tulip, iris, or narcissus bulbs in a box of soil. Water daily and observe growth of plants from bulbs.
5. See Grade 3, Science, Unit III, Concept A, Activities 5 and 6.

Concept H PLANTS HAVE DIFFERENT TYPES OF ROOTS

Activities:

1. Let children dig up various kinds of roots, including grasses and weeds. Wash the soil from the roots and observe their structure. Discuss how the fibrous (grass) roots cover wide areas, shallow depth, absorbing water from close to the surface. Observe and discuss the long and thick tap root (dandelion) as it grows deep into the soil for a deep water supply.
2. Let the children make a chart showing the kinds of roots.

Concept I PLANTS PLAY AN IMPORTANT ROLE IN CONSERVATION

Activities:

1. Look for examples of erosion on the school grounds. Discuss how this can be prevented.
2. See Grade 2, Science, Unit II, Concept A, Activities 1, 5, 6, and 7.

Unit IV - Things In The Sky

Concept A THERE IS AN OCEAN OF AIR AROUND US

Activities:

1. Take your children for a walk across the school grounds holding a pinwheel, balloon or a kite. What happens to the object being held? Why?
2. Blow two balloons to the same size. Tie a balloon to each end of a yardstick. Suspend the yardstick in the middle so that it will balance. Burst one balloon with a pin. What happens? (They will become unbalanced. Air has weight. The balloon with air weighs more than the balloon without air).

Concept B THE ATMOSPHERE IS MADE UP OF SEVERAL DIFFERENT REGIONS

Activities:

1. Have each child observe a cloud, a bird, and an airplane. Discuss why a bird will fly only to a certain height, and how some clouds appear to be at different heights in the sky. Discuss why some airplanes have pressurized cabins.
2. Visit an airport and have a pilot talk to the class about airplanes, and show a demonstration of oxygen masks.

Concept C STARS DIFFER IN MANY WAYS

Activities:

1. Have children observe the night sky. Note the compass direction of the Big Dipper. Have them draw what they see. Look for stars that seem to be bigger than others.
2. Have children go out on a clear night and study one portion of the sky with a telescope. Look for stars that seem to be twinkling.
3. Visit the EPS planetarium for further lessons on stars.

Concept D CLOUDS VARY ACCORDING TO THEIR SIZE, SHAPE AND COLOR

Activities:

1. Have children observe clouds over a period of two weeks to collect information to be used in preparing a chart on the color, size and description of clouds.
2. Let the class take photographs of different clouds to mount in an album or booklet.
3. Pour some very hot water (not boiling) into a milk bottle. Place an ice cube in the mouth of the bottle. What happens? Why? The inside of the bottle becomes cloudy and water collects on the inside of the bottle. The hot water in the bottle evaporates into the air above it in the form of water vapor. When this vapor comes into contact with the ice cube it condenses, or changes back to water, and can be seen as mist or a cloud. Some of it condenses on the inside of the bottle.

4. Have children imagine they are taking a ride on a cloud. Tell what it is like, how they feel, and what they see.

Concept E THE MOON, WHICH GOES AROUND THE EARTH ONCE EACH MONTH, IS DRY, DUSTY AND RUGGED

Activities:

1. Illustrate how a crater is formed by throwing rocks or marbles into smooth sand or dirt. Some children will throw theirs with more force than others, thus some holes will be deeper than others. Discuss the fact that the harder a meteorite hits the moon's surface, the larger the craters will be.
2. Have children make a model of part of the moon's surface by filling a box with sand. Form mountains and craters in the sand. Wet parts of it to make it hold together like moon rock. This can also be done with clay. Let the clay harden and paint it different shades of brown or gray. This will make it more realistic.

Concept F OUR SUNLIGHT IS MADE UP OF MANY COLORS, (RED, ORANGE, YELLOW, GREEN BLUE, INDIGO, AND VIOLET

Activities:

1. Have children make a rainbow by spraying water into the air from a garden hose. Stand with your back to the sun. The spray reflects the colors of the rainbow because of the way the sun's light rays are bent.

2. Darken a room but allow a ray of sunlight to enter. Hold a triangular glass prism in the ray of sunlight and notice that the colors are always in the same order. As light passes through a prism, its rays are bent at different angles and separated into colors of the rainbow.

Concept G LIGHT FROM OUR SUN TRAVELS IN STRAIGHT LINES

Activities:

1. Before the class begins in the morning and every half-hour during the school day, have a student mark on the ground the position of the flag pole shadow's end. When the last mark is made, have the class observe. As you line up the marks on the ground with the top of the flag pole, they will be able to determine the path of the sun in the sky.
2. Use the sun to tell time. Have the children make a simple sundial by placing an upright stick in the ground to cast a shadow. Use the shadow of the stick to read the time just as you do the hour hand of the clock.
3. Let the students go outside and find north by using the sun and a watch. Hold the watch flat in the hand. Place a match, straw or pencil upright along the edge of the watch. Turn the watch until the shadow of the match, straw, or pencil falls directly along the hour hand, and the hour hand will then be pointing directly at the sun. Between the hours of Six A.M. and Six P.M.,

a line from the center of the watch dividing the small angle between the hour hand and the figure twelve will point true south. (The hour hand is still pointing toward the sun). True north can be found by projecting a line from south to north.

Concept H PLANETS AND SATELLITES MOVE AROUND THE SUN IN AN ORDERLY MANNER

Activities:

1. Play the Sun Game in the outdoors. Select a large student for the sun. The sun must be bright, cheerful, big and strong. He stands in the center of the playground and chooses an earth (smaller child). The sun gives one end of a string to the earth and lets the earth move away from him about twenty feet. Now earth chooses his moon, and gives him the end of another piece of string about five feet long. The sun holds his string above his head. Earth begins to turn around and around (like in daily rotation) and at the same time travels (revolves) around the sun as fast as he can keep the string off the ground. While this is going on, the moon must run around the earth as fast as he can, keeping his string off the ground and also his face toward the earth at all times. This is exactly what the moon does as the (back) side is never seen from the earth. The idea of the game is to see if the moon can run around the earth at least twelve times

while the earth goes completely around the sun once. All this orbiting makes earth quite dizzy. Slow down a bit and plan an Eclipse Game.

2. Eclipse Game is played with the same positions as the Sun Game. Sun, moon and earth all close one eye. Keep strings tight, sun and earth stand still facing each other. Moon moves around until earth cannot see sun's face. This is an eclipse of the sun.

Unit V - Sound

Concept A SOUNDS ARE CAUSED BY SOMETHING THAT MOVES OR VIBRATES

Activities:

1. Have the children sit quietly among the trees or bushes. Listen to the sounds of nature. Discover what is causing the sounds and record them on a chart.
2. Take children outside. Have someone put his ear to the ground while someone else, farther away, stamps the ground. Discuss why the child listening to the noise can hear it. (Sound is vibrating through the ground). Indians and hunters have used this method to hear men or animals walking nearby.
3. Drop a heavy object into a pan of water. Let the children observe the waves made by the object. Point out that sound vibrations can travel through water.
4. Connect two cans with ten feet of heavy strings. Have children communicate with each other on this device. Discuss why it is possible to hear the sound in the can.
5. Tie a spoon in the center of a five-foot string. Have the children wrap the ends of the string around their forefingers and place their forefingers against their ears. Tap the spoon with something. Discuss the results.

Concept B SOUND WAVES CAN BE DIRECTED

Activities:

1. Have a child speak through a megaphone outside. Then

Have him speak without it. The rest of the class can listen to the change. Have the children listen to the megaphone from in front and from the side. The megaphone is directing the sound waves straight ahead.

2. Make a megaphone in class by stapling or gluing a large piece of construction paper in the form of a cone.

Concept C SOUNDS CAN BE MADE HIGHER OR LOWER DEPENDING ON THE AMOUNT OF VIBRATION

Activities:

1. Hold a leaf or blade of grass between the thumbs placed side by side with the fists doubled. Blow lightly on the edge of the leaf or blade of grass. Listen for the sound. Then blow harder. The faster you blow air past the leaf or grass blade, the more it will vibrate and become louder.
2. Fasten several rubber bands to pairs of nails, firmly placed in a board, at various distances apart. Pluck each to compare the sound. The tighter the rubber band is stretched, the higher the sound.

Unit VI - Forces

Concept A GRAVITY IS A FORCE WHICH PULLS OBJECTS TOWARD THE CENTER OF THE EARTH

Activities:

1. Have children go outside and toss up objects of different materials and weights; such as bits of paper, feathers, cork, small pebbles or other light material available. Talk about the way each kind of material falls. Observe if they fall at the same rate of speed. Observe that all things fell whether thrown hard or lightly.
2. Use the globe and explain that the globe is a model of the world. Use toys that will adhere to the globe. Place them on the globe to demonstrate that down is toward the center of the earth, and up is away from the center.

Concept B FRICTION IS A FORCE THAT HELPS THINGS TO STOP MOVING AND, IN THE PROCESS, GENERATES HEAT

Activities:

1. Make up a list of examples of friction by searching around the school and playground.
2. Make sandpaper by spreading glue on strips of paper, sprinkling sand on the paper and letting it dry. Prepare small blocks of wood and put sandpaper on the end of each block. Prepare enough blocks for all the

children to have two blocks. Have children rub the blocks together and discover what happens. Note heat produced. Use the blocks to sand a rough piece of wood used in an art project.

Concept C INERTIA MAKES THINGS AT REST REMAIN AT REST, AND MAKES THINGS IN MOTION MOVE UNIFORMLY IN A STRAIGHT LINE UNLESS AN OUTSIDE FORCE ACTS UPON THEM

Activities:

1. Have a child roll a ball down a board for a ramp, on the sidewalk or blacktop. Mark the distance covered. Note the difference in the distance that the ball rolled. Discuss what might cause the difference in distances.
2. Have a child put a doll in a toy car. Roll it across the blacktop. Have the car stop suddenly by hitting an object. Have them observe what happens to the doll. Discuss the reason. This can also be applied to safety of riding in a car.

Unit I - Indians and Pioneers

Concept A INDIANS AND PIONEERS LIVED OFF THE LAND

Activities:

1. Have children collect nature materials and make replicas of different Indian and pioneer homes.
2. Have children collect nature materials and make replicas of the different transportation vehicles used by the Indians and pioneers (canoes, boats, travois and covered wagons).
3. Plan an Indian and pioneer menu with the class. Have a cookout and serve the foods used by each group. Moms probably will be glad to help.
4. Make Indian jewelry from natural materials.
5. Make a totem pole like those used by the northwest Indians. They are easily made by stacking oatmeal and cereal boxes, that have been decorated with construction paper, and Indian designs and faces.
6. Distribute small paper teepees to each child for every Indian or pioneer book he reads. Assemble all the smaller ones finally into one large class teepee on a wall or bulletin board.

Your thought, put into an activity, can make it pleasant, interesting and profitable for your children.

Concept B INDIANS COMMUNICATED IN MANY WAYS

Activities:

1. Make Indian symbols to use in showing the way down a nature trail.
2. Take the class on an Indian hike. Go in single file, very carefully. Try not to make a sound. Avoid stepping on dry twigs or through dry leaves. Don't talk above a whisper. Stop frequently to listen as well as to look. What sounds can be heard?
3. Let children write stories, using Indian signs and symbols, to share with the class.
4. List the Indian names and expressions used today for rivers, lakes, towns, provinces and counties.

Concept C INDIANS AND PIONEERS FOUND TIME FOR SONG AND RECREATION

Activities:

1. Have a resource person come to your class to share some information on Indian lore.
2. Have children make Indian drums to be used with Indian dances.
3. Go to the Field Museum to see Indian relics and musical instruments. Lords Park has an Indian section at its museum.
4. Dramatize some of the Indian beliefs about their gods, evil spirits and religious ceremonies.
5. See EPS Social Studies Guide for Grades 1, 2, and 3, pages 84 - 95.

Unit II - Communications

Concept A FROM THE BEGINNING OF TIME MAN HAS COMMUNICATED THROUGH SIGNS AND SIGNALS

Activities:

1. Demonstrate how to make charcoal from burned wood or coals. Let children draw pictures on rocks or pieces of wood as cavemen might have.
2. Let children use mirrors to send messages. Have a code prepared to follow.
3. Have children demonstrate the pony express method of sending messages by running with messages from one to the other on the school grounds.
4. Have children use Morse Code to send messages.

Concept B MODERN MAN HAS CONTRIBUTED MUCH TO IMPROVE COMMUNICATION

Activities:

1. Have children observe and discuss street signs, policemen's signals, advertisements, etc. to see how we communicate in written word.
2. Take a trip to the telephone company.
3. Visit the Courier News or a publishing company.
4. Visit WEPS Radio Station.

Concept C ANIMALS, INCLUDING MAN, COMMUNICATE IN MANY WAYS

Activities:

1. Observe animals in the wild, at home, or on a farm to

detect their methods of communication. Sounds, body movements, and general activity may be communication.

2. Bring a trained dog to class. Demonstrate how man communicates with animals through commands.

Unit III - Our Community

Concept A THERE ARE MANY FACILITIES AND SERVICES IN OUR COMMUNITY

Activities:

1. Use EPS Social Studies Guide for Grades 1, 2, and 3, pages 57 - 68.
2. Let children take photographs of important facilities, points of interest, landmarks, and your school to use in an album.
3. Visit places such as the Fire Department, Police Station and jail, post office, library and the court of appeals.

Unit I - Using Language

Concept A ALL FIVE SENSES CAN HELP IN DISCOVERING THINGS

Activities:

1. Have children write a descriptive paragraph about what they heard or saw or smelled while they were on a nature hike. The purpose of the hike should have been to carefully be alert to birds, insects, leaves and any other things they could detect through one or more of their senses.
2. Weave sounds into a story by letting each child or small group select one source and imitate its sound each time it is mentioned in the story.

Concept B ONE CAN LEARN NEW WORDS THROUGH INVOLVEMENT IN OUTSIDE ACTIVITIES

Activities:

1. Take the class outside to find something in nature that begins with A, B, C . . . .
2. Have children make one-sentence descriptions of things they observed on a nature walk.
3. Have children research some area of particular interest they found while outdoors.

Concept C INFORMATION CAN BE GAINED THROUGH ORGANIZATION

Activities:

1. In an outdoor setting have groups of children make up

informative clues about an animal or plant that lives in that environment. Let the rest of the class guess what they are describing.

2. In a wooded area, play a game of blinding and describing. Blindfold each student and give each an object to describe. Have the class identify the object being described by the clues that are given.
3. After a trip outdoors, help the children to organize sense impressions by putting a list of words on the board of things that they have tasted, heard, seen, felt, or smelled on their nature walks. Have them classify the words under the proper sense heading.
4. After any one of your outdoor experiences have the children write a letter to someone telling them about their experiences.

Unit I - Mathematics Outdoors

Concept A GEOMETRIC SHAPES CAN BE FOUND IN NATURE

Activities:

1. On a nature walk, observe and list all the different shapes found in flowers, leaves, stems, trees, shapes, or animals.
2. Find in nature the beauty of repetition of shapes. The leaves of a tree are the same shape, but make beauty. Even the edge or veins of a leaf, or bark of a tree will demonstrate repetition of geometric shapes.

Concept B THE OUTDOORS PROVIDES OPPORTUNITIES TO LEARN AND USE MATHEMATICS

Activities:

1. To help with addition and subtraction, form sets with the children outside.
2. Have the students estimate the distance between two trees. Pace the distance after measuring the pace to compare measurements.
3. Use a thermometer in sun and shade and determine the difference.
4. Have the children experiment with a compass to try to learn on their own how it can be used. Lead them to discover North, South, East and West by using the compass. Set up a simple compass trail with two or

three changes in direction.

5. Divide the class into two groups - Romans and Arabs. Each group will be given a slip of paper with four numerals on it, like 8 - 4 - 9 - 1 or 5 - 3 - 2 - 7. The numbers are different on each slip. Each group is to act out, without speaking, with body actions, positions, or postures, their numbers. The other group is to guess what number they are trying to show. The Arabs will be using Arabic numerals, and the Romans will use Roman numerals.

Unit I - Art From Nature

Concept A THERE IS A VISUAL RELATIONSHIP BETWEEN ART AND NATURE

Activities:

1. Have the children make a collection of a variety of nature forms. These may range from dried insects to pine cones and sea shells. Have at least three nature forms for each person. Supply a paper bag for each person, plus one extra. Have someone pack three shapes in each bag. Clear a table or shelf for a display of of the objects. Give each child a bag and ask him to pick out two objects, on the basis of touch alone, that seem to be related to each other. Give each enough time to explore and feel the objects. After everyone has had time to describe (without naming the object), the texture, shape, and feel of the objects, ask them to take out the most unrelated objects from the bag. Discuss how the sense of touch does not always correspond to our sense of sight. We describe something differently when we can only touch it and not see it.
   A follow-up to this lesson could be to group the objects into sets with various relationships.
2. Have children make a collection of pretty rocks and pebbles. Discuss these shapes and textures. Have the children group the rocks into pleasing arrangements

and, with charcoal, sketch pictures of the arrangements. A lesson in shading can be taught also. The rocks will be lighter on the side facing the sun than the other.

Concept B THERE IS RHYTHM AND BEAUTY IN NATURE

Activities:

1. Take the class outside where there is a wooded area. Have them sit on the grass and tell them that they are going to pretend that their eyes are the eyes of a camera. Tell them to observe things around and above them such as a bird or tree. They should look for things that are made up of different lines (zigzag, straight, curved and wavy) and lead them to the conclusion that all things in nature are made up of some kind of lines. Have children make sketches of the things they observed using the different types of lines (rhythms) that they were made up of.
2. On a day when changing weather is in the air, and a storm is coming, take the children outside to observe the darkening sky, the clouds, the direction of the wind, birds seeking shelter, and the appearance of trees and leaves. As they observe the coming storm, help them discover the beauty and rhythm in the swaying branches and leaves. Paint stormy weather pictures.

Concept C NATURE PROVIDES MANY MATERIALS WE CAN USE IN ART

Activities:

1. Find a flower outdoors to be used as a subject for realistic drawings from nature. Explain that they must observe it closely before they begin. Use colored chalk on a neutral colored paper for a pleasant effect.
2. Take children outside to collect stones for a mosaic. Each child fills a shoe box cover with plaster and sets the stones in this as it dries. The stones may be painted with tempera in designs.
3. Make jewelry, by threading on yarn or string, some materials like nuts, seeds and berries you have collected.
4. Christmas decorations can be made from pine cones by spray-painting them red or green and gluing little things like seeds or berries to them.
5. Mother might appreciate a spoon holder made from clay. Have children roll out pieces of clay to about three-eights inch thick. Use a sharp-edged or pointed modeling tool to cut out a leaf shape and add surface designs of the leaf veins. Curve up the edges to hold the spoon. Let them dry thoroughly.
6. Have you tried making seasonal dioramas recently? Use a shoe-box, and have the students design and make the background. Then add trees, animals or other three dimensional pieces. Background is usually painted,

made with crayons, or clay could be used. Paper figures can fill out the rest of the diorama, but wire figures would make for a variety.

7. Indian teepees can be built from heavy brown construction paper and twigs. Ask the children to make outdoor and Indian designs on their paper with crayons before beginning construction. The twigs glued inside the top opening of the teepee add realism. The finished teepees could be arranged to make a village scene, adding other items such as Indian figures, bark canoes and trees.

8. Interesting designs can be created with vegetables. (Carrots, potatoes, cucumbers, cabbage, corn, green peppers, and pears make interesting shapes). Others, like corn on the cob, can be rolled in the ink or paint and then on the paper for a polka dotted effect. The potato can be cut in half and a design carved out in the top of one half. It can then be used as a rubber stamp. Use various colored ink pads and paper for an interesting effect.

Unit I - Music

Concept A THERE IS MUSIC IN NATURE

Activities:

1. Sit quietly and listen for melodic sounds of nature, (birds singing, rustling of trees, buzzing of insects).
2. Name that tune: The person who is "It" selects a familiar song and beats out the rhythm. He taps with a stick on the ground or on wood, or claps with his hands. He can also tap two sticks, rocks, or blocks of wood together. The group asks yes or no questions to help them guess the name of the song.
3. Make a band using musical instruments from nature, (stones, sticks, dry grass, or seeds).
4. As the class sits outdoors have each child think of an object he sees and make up a sentence about it. Try singing that sentence to a familiar tune or make up a tune as you go.

Unit I - Health and Physical Education

Concept A KNOWLEDGE OF HAZARDS AND SAFETY PRECAUTIONS MAKES IT POSSIBLE TO LIVE, LEARN, AND PLAY SAFELY IN THE OUTDOORS.

Activities:

1. Take the class on a walk to identify poison ivy by its leaves, woody branches, or vines, and by the fruit.
2. Use garden tools to learn proper use.
3. Discuss with the class safety precautions in using playground equipment.

Concept B WE CAN USE THE OUTDOORS FOR COOKING, EATING AND PRESERVING FOODS

Activities:

1. Have a cookout with the class. Hold meetings prior to this to plan a good meal, to list equipment and food needed, and to decide responsibilities of each class member.
2. Have class preserve foods by letting them dry out in the sun. Place some fruits, such as apples and peaches, on a piece of wood where they will be in direct sunlight. Point out that by using this method none of the vitamins are lost. These foods can be kept in a plastic bag until needed.

Concept C THE OUTDOORS IS A GOOD PLACE TO KEEP PHYSICALLY FIT

Activities:

1. Leaf Relay: Divide the players into several teams. Have them collect leaves from a number of different kinds of trees. Collect as many leaves from each tree as there are teams. For every team, make a leaf pile consisting of leaf from each tree. Place this pile at a set distance in front of each team. The teacher calls the name of the tree, then says "Go"! The first player on every team runs to his pile of leaves, finds a leaf from the tree named and holds it up. A point is scored for every leaf named correctly. The leaves are returned to the piles and the players go to the ends of the lines, and the game begins again.
2. Acorn Run: All players but the one who is "It" stand in a line with hands held palms together, in front of them. The one who is "It" goes along the line with an acorn held in his hands and slides his hands between the hands of each player, leaving the acorn in one player's hands. This player must run to a designated goal without being caught by the other players. He need not start running at once, but must start before "It" has reached the end of the line. "It" does not chase him. The player who succeeds in reaching the goal without being tagged, or the player who tags him, becomes the next to be "It".

3. Play Tug of War.

4. Take the class outside for a guessing game on moving things in nature. Let each child select something which moves and imitate its movement. The rest of the class must guess the object being imitated.

5. Consult the school physical education teacher or the EPS Physical Education Guide for third grade.

Grade 4
Science
Unit I

Unit I - Ecology

Concept A ALL THINGS IN NATURE DEPEND ON EACH OTHER

Activities:

1. Select an area on the school yard as a setting for an ecology study. Take several trips to this area noticing and identifying plant or animal life. This should include digging in the ground. Notice animal homes and their location - relate to the plant life available in the area and other characteristics as possibilities for protection and food.
2. Build a terrarium that is as nearly like the area as possible. The best way to start is to take the class on a field trip, bringing with them a trowel, bucket, and plastic bags. Here is what you will need.
    a. Gravel (fine) or sand
    b. Charcoal
    c. Woods soil containing humus
    d. Small plants and tree seedling (be sure to include the soil to protect the roots). Some examples might be mosses, violets, ferns, wintergreen, bean seeds, partridge berry, etc.
    e. Small dish for water (pond)
    f. A good looking rock (aesthetic value)
    g. Plastic wrap or pane of glass to cover the terrarium.

page 90 blank.

h. Animals. Examples would be snails, grasshoppers, frogs, lizards, beetles, caterpillars, praying mantises, etc.

Gravel or sand is put in the terrarium first to store excess water. Then add charcoal to keep the soil from becoming sour and absorbing gases. The soil from the woods is added next to a depth of about four inches above the charcoal. Plant the small plant but be carefull not to overcrowd them. Cover the remaining soil with moss. Sink the small dish into the soil and fill it with water. Place the rocks into nice looking positions and cover the terrarium with the cover. After a couple of days, have the children bring their "animals" for the "little world".

3. Observe the steady growth of plants, animal feeding, and rain in the environment you have made.
4. Find a dead tree. This acts like a little hotel. In it many animals and plants come to live, eat, or rest. Outside the tree might be found gray-green lichens. There probably are mushrooms located on it. Look for moss on its North side. Some of the tenants of this hotel are: squirrels, ants, owls, cocoon, birds, bats, and moths.
5. Use binoculars for bird watching in area.
6. Take plaster of paris prints of animal tracks in area. You can bait animals by using food if the terrain near your school is right for this.

Concept B BROAD-LEAF AND CONIFER TREES MAKE DIFFERENT ENVIRONMENTS

Activities:

1. On a field trip gather examples of broad-leaf trees and conifers. Examples are: leaves, bark, fruit, or seeds. Note location where you found these.
2. Go on a tree sketching trip. Go to a selected ecology area (park-forest preserves) and identify conifers and broad-leaf trees found there. Note their location in relation to sun, shade, water, and nearness of other trees. Notice birds that nest in each, do any of these prefer one to the other - why? Here should be noted availability of seeds, fruit, nuts, insects, worms, etc. Predict the future landscape of the area.
3. Make an unlabeled tree map of the area. Have children study the map and later identify these trees on a field trip.
4. Start a display of samples gathered with fruit, leaf, seed, and bark of each tree labeled and placed together.
5. Compare the ability of conifer and broad leaf trees to give off water. Place mercury in the bottom of two test tubes. Seal the test tube with two corks that have holes in them. Through the corks, into the mercury, place a pine twig and maple twig, both with leaves. Why do conifers keep their leaves all year round?

Concept C THE CROWN, TRUNK AND ROOTS WORK TOGETHER TO SUPPORT LIFE

Activities:

1. Select a few trees and examine them for their main parts. Are there any exposed roots due to erosion? What are the main differences in structure?
2. If possible find an overturned tree and examine the primary and secondary roots. Draw root system.
3. Pull up some tree seedlings or weeds. Examine the root hairs by using some magnification.
4. Adopt a tree in the fall. Watch the leaves fall. Look for winter buds. Notice changes that occur in the winter and early spring. Watch the new leaves and new growth appear as the buds open. Branch tips are always living. Keep a booklet or chart of changes that occur.
5. With your adopted tree make a "Fact List", p. 136 Tips and Tricks in Outdoor Education
6. Using a trunk borer (be careful not to damage the tree) to remove a sample of the interior of the tree trunk. Note the different layers. The Cambiam layer located just inside the bark is the only growing part of the trunk. Replace and repair the hole.
7. Find a stump and count the growth rings to determine age of tree. Make a "Fact List" for the stump, p. 137, Tips and Tricks in Outdoor Education. For fun, have each child pin a little flag on the ring that tells his own age.

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8. Cover a trunk with a piece of paper and color over it. The growth rings come out on the paper and can be used for further study.

9. Compare tall and smaller trees for the animal life found in them. List animals observed and record differences. For example, cardinals and blue jays may be found in small trees and shrubs, while squirrels and grackles nest only at the top of large, tall trees.

10. Study the leaves that make up the crown of several broad-leaf trees. Gather specimens and identify according to special characteristics. What color is it? What is the vein pattern like? Is it compound or simple? Are the leaf edges smooth or are they toothed with lobes?

Concept D <u>TREES PROVIDE FOOD, SHELTER, AND PROTECTION FOR MANY ANIMALS</u>

Activities:

1. Take a trip to the woods or forest. Look for animals and animal homes in or under trees. Listen for bird and other animal sounds.

2. Set up a tree learning station (the tree should be selected before hand to make certain of its value). Take small groups to the tree and look for the following:

    a. New tree seedling - notice location of growth

    b. Lichens and moss

c. Insects on trunk or insect homes that are usually found at the bottom

d. Woodpecker evidence

e. Birds and bird nest

f. Color of tree and trunk

g. Insects or eggs found on leaves

h. Animal footprints and homes in or near the trunk of the tree

3. On another visit to a stump, observe plant and animal life found on it. Take notes and identify animals in classroom. Compare with those animals found on living trees. What conclusions can you draw? Life is full of wonders, all we have to do is use a little ingenuity to discover them.

4. To complement activity 3 do the investigation on p. 159, Concepts in Science 4. Relate bread mold to fungi. These plants cannot make their own food. Where do these plants get their food?

Concept E <u>A BIRD BUILDS ITS HOME NEAR FOOD, WATER, AND SHELTER</u>

Activities:

1. Observe the ways that birds get food. Assign children to watch for methods and procedures used by birds in getting food. Binoculars are handy in this activity. Why do birds have different shaped beaks? Draw them.

2. Make a feeding station. Observe and take notes on birds visiting the station. Identify the birds and note their beaks, claws, and flight patterns.

3. Go on a bird nest hunting trip (hike). Listen for bird calls and note where the nest was found.
4. Observe birds in woods, meadows, and in backyard through binoculars and at close range. Look for size, color, flight pattern, song or call, nesting site and physical make-up (bill, feet, and feathers). Relate habitat to food habits like insects, fruits, seeds, etc. and protection.
5. Set up bird trap.
6. Bird scrapbooks, mobile, and flash cards are fun activities for the classroom.
7. See Activity 1, Language Arts.

Concept F SOME BIRDS MIGRATE

Activities:

1. Visit McGraw Wildlife.
2. In late Fall and early Spring look for migrating birds.
3. Study the principle of flight. Compare the feathers and flight pattern of ground birds with tree birds. Note the shapes of tails and wings. Does the flight pattern relate to feeding habit (Martins and Mosquitoes)?
4. Obtain a fallen wing feather and make a sketch of its structure.

Concept G INSECTS SERVE AS FOOD

Activities:

1. Go back to our tree and stump stations. Collect and

identify insects found there. Bring one of each back. They can be killed by putting them in a killing bottle. This might be made with a baby food jar. Fill the bottom (1/8 of an inch) with ethyl acetate, ether, benzene, or carbon tetrachloride. Put the insects in the jar and put the lid on. It doesn't take long once they inhale the fumes. Be careful of these inhalants, they are flammable and must be properly used.

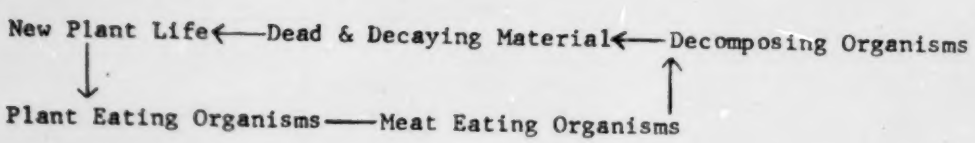
2. Use a spreading board if available, but cardboard would do, and mount the insects to prepare collection for exhibition.
3. Obtain from wooded area insect homes, eggs, cocoons, and galls. Keep eggs, egg cases, cocoons, and galls in the classroom and observe daily waiting for emergencies. When this happens, identify.
4. Study feeding habits of butterflies and moths. Relate this to feeding of birds. Use the binoculors to identify insects being eaten. Was it in a tree, on the ground, or in the air?
5. Build an ant farm. Some of the materials needed are: paper bag, soil, sand, flat pan, ants, large glass jar, black paper, string, water, and small pieces of sponge. Put the sand, soil, and ants (from one colony) into the jar and place the jar into the flat pan filled with water. Cover the jar with black construction paper. Keep the ant farm at room temperature and out of direct

sunlight. Feed the ants honey or sugar and place it on cotton. Give them water on a small sponge but pour it sparingly on the soil. After several days remove black paper and observe using magnifying glass. Be sure to keep paper around the jar when not observing. Replenish water in pan frequently.

6. Place three or more crumbs of varying sizes in your ant farm. Observe how ants help one anoth
7. This can be done using a grasshopper also. Cut the grasshopper into three pieces. Activities 6 and 7 can be used while waiting for the tunnels to be dug.
8. Look for a deserted bee, wasp, or hornet nest. BE CAREFUL.
9. Make charts showing different food webs. For example:

a.

b.



Unit II - Weather

Concept A WEATHER AFFECTS THE LIFE, GROWTH, AND DEVELOPMENT OF ALL LIVING THINGS

Activities:

1. Find the differences in temperature in different places on the school yard. Where possible, compare temperatures on the North and South side of a hill. Relate to plants and animal life found on each side. Compare windy and calm areas, deep and shallow water, snow and ice, or surface soil and subsoil.
2. Twice daily, take the temperature reading outside. Probably early morning and late afternoon is best. Record the temperatures on a graph. Keep logs and determine which month (or week) had the highest, lowest, and most varied temperatures during the year.
3. See the effect of heavy rain on soil erosion. Take a field trip in a local area (walking) after a heavy shower. Observe effects of bare surfaces and note lack of animal life and plant life in these areas.
4. Do activity on p. 242, Concepts in Science 4.
5. Visit a tree stump (newly cut if possible). Find the largest gap between two rings. Count backwards to find number of years ago that, that particular growth was accomplished. Find the amount of rainfall during that year. How are they related?

6. Have children bring in weather instruments and discuss their use.

Concept B CLOUDS HELP PREDICT WEATHER

Activities:

1. Have children keep records for several days of the kinds of clouds that are visible. Have them identify and help them learn what each type means.
2. Do activity on p. 72, Concepts in Science 4.
3. During a thunderstorm, gather in a protected area and observe closely not only the lightning but the movement, height, color, and type of clouds.
4. On a clear, bright day when cumulus clouds are present, take groups of children out to sketch forms, faces, and body shpaes they see in the clouds. Have them share these sketches and perhaps initiate a skit.

Unit III - Prehistoric Plants and Animals

Concept A FOSSILS ARE REMAINS OF PLANTS AND ANIMALS THAT LIVED LONG AGO

Activities:

1. Explore for and gather rocks containing fossils.
2. Identify all fossils.
3. Making a fossil - take two balls of clay and flatten them into sheets 4" x 4". Keep the sheets of clay about 1/4" thick. Put in the middle of the two sheets of clay, a twig, leaf, bone, or dead snail. Push together the two layers of clay and relate this to sediment layering of fossils.
4. Collect some twigs on the school ground. Put them in a test tube and heat until carbon forms. This shows one way that plants decompose into carbon.

Unit IV - Materials of the Earth

Concept A MATTER IS EITHER SOLID, LIQUID OR GAS AND CAN BE CHANGED FROM ONE TO THE OTHER

Activities:

1. Have the children go outside and identify the different stages of matter around you. Gases will require an explanation.
2. Have each child collect a handful of snow, snowball or icicle. Place in pans, beakers, etc. and note the time it takes to melt into a liquid -- the time it takes to evaporate.
3. Place a few chunks of dry ice and a few ice cubes on the pavement on a very hot day. Do we see the three stages of matter here?

Concept B MATTER MAY BE IDENTIFIED BY CERTAIN PHYSICAL PROPERTIES

Activities:

1. On a field trip, have the children give properties of substances like rocks, trees (wood), water, grass, air, flowers fruits, etc. Properties like hardness, color, smell, taste, and size should be discussed.
2. The games twenty questions, hot and cold, or animal, vegetable, or mineral would be fun to play outside.

Concept C AS CHEMICAL CHANGES TAKE PLACE, NEW SUBSTANCES ARE FORMED

Activities:

1. Place a nail outside and watch it rust or oxidize. In time the nail will become iron oxide which is a brown (rust color) substance. This is an altogether different material. What are the physical properties of iron and iron oxide?
2. Rust is responsible for millions of dollars worth of damage every year. On one of your nature hikes have the children write down all objects that are rusted.
3. After activity one is finished, have them take two nails, paint one and leave the other as it is. Place them outside and observe.
4. Place a carton of milk on the window sill for three days (warm weather). What happens? Do we still have milk? What properties have changed?

Unit V - Energy To Do Work

Concept A WORK IS DONE WHEN AN OBJECT IS MOVED

Activities:

1. Push hard against a large tree. No work is done. Push hard on a small cart, bike, etc. The movement produced means work was finished.
2. Hook up a hose and move basketballs from one end of a line to the other (30 yards). A game could be made of this.

Concept B OBJECTS FALL TO EARTH DUE TO GRAVITY

Activities:

1. Take an appreciation field trip. Help children to see the importance of gravity in keeping the balance of nature. Seeds drop to the ground in order to take root and grow new plants. Rain falls, bringing life to plants and animals. Animals that live on the surface of the ground may obtain their food supply from falling objects such as seeds, nuts and fruit. Leaves and dead branches that drop from trees decay and enrich the soil for plant life.
2. On the appreciation trip, observe animals in nature and observe the effect of gravity on them. For instance, frogs have large and strong legs to help them jump against

gravity's force; and the wings of birds must be both strong and light to overcome gravity.

Concept C THERE ARE DIFFERENT FORMS OF ENERGY

Activities:

1. Go outside and notice light and heat energy from the sun.
2. Listen for sounds; look for moving objects (mechanical energy), feel heat energy.
3. Keep a list of the forms of energy you come into contact with and how they were used.
4. Make models of simple machines, inclined plane, wheel and axle, pulley and lever. These can be made from simple inexpensive materials. Test and use these on the playground.

Concept D THE COLOR OF AN OBJECT AFFECTS ITS ABILITY TO ABSORB OR REFLECT HEAT ENERGY FROM THE SUN

Activities:

1. Use soil thermometers to take the temperature of different textures of soil. Discuss and compare how color affects temperature. Soils to use are sand, clay (red and gray), and dark loam.
2. Place thermometers in two shoe boxes. Cover one with a white cloth, one with a black cloth. Place outside in the sun above the ground for a couple hours. Compare the temperature of the two boxes.

Unit I - Map Skills

Concept A MANY SKILLS ARE INVOLVED IN USING, MAKING AND READING MAPS

Activities:

1. To determine distance by measurement and gain some proficiency in judging distances through visual perception, measure off and mark with flags or paper markers, 100 feet, 200 feet and 300 feet. Have children remember that a mile is 5,280 feet. After some practice with this, have a contest on distance judgment with premeasured stakes or landmarks.
2. Pacing: Determine the length of each child's pace (double step). Mark off a hundred foot distance. Have each child walk this, counting his own steps. Then divide the number of steps into 100 to determine length of the child's pace. Use this information to make simple scale maps using each child's pace measurement. Another use of the pace would be to check a visual estimation of a distant object with the pace as a more accurate approximation. Finally measure with a tape.
3. Draw a simple map of the school or school site. Teach the use of symbols or have children make their own for whatever they wish to include on the map.
4. Find map directions with a paper circle showing sixteen compass directions and degree readings. Spread a map

in front of you. Decide on a specific spot on a meridian line of base of operations for practice in determining directions. North will be up from that spot, south will be down, east right and west left. Take an imaginary trip from base of operation to a given town or landmark. The object is to learn approximate degree readings and direction of travel from base to a destination.

5. Map the flow of people in the school and on the school grounds, coming to school, between classes, lunch time, during classes or going home. There are various patterns such as those of teachers, pupils, boys and girls.
6. Children may make maps of ways to get to school from their home. The shortest, longest, quickest and safest ways are ideas. This activity may lead you with your class to find many new ideas for mapping various patterns.

Concept B <u>THE WORLD IS DIVIDED INTO LARGE LAND AND WATER MASSES WITH GREAT VARIATIONS IN ELEVATIONS AND FORM</u>

Activities:

1. Landmark hunt: Bring your group to a high point of good visibility where they can see a number of different landmarks. Provide each child or team with a topographic map of the area and a pencil. Give directions similar as follows:
    a. Indicate on your map, by drawing a circle around it, the point where you are now standing.

b. Circle the church approximately northwest of here.

c. Circle crossroads approximately south of here.

Set a certain time for finishing the project. Score points for each landmark found correctly. A variation from listing landmarks might be to put up a number of markers on stakes in a circle, each marker pointing to a different landmark. These markers may be made of strips of wood 1" x 2" x 10", with nails to act as sights at eye level. One end of each marker is pointed. The other carries a strip of cardboard with a description of the landmarks such as "church". Players move clockwise from marker to marker.

2. Make relief and products maps using one part salt, to two parts flour, and food coloring mixed with water to a clay consistency. Place this, and form it on plywood.

3. Invite world travelers to your class.

Unit II - Land of High Mountains

Concept A IN THE MOUNTAINS, HAY CANNOT BE CURED ON THE GROUND BECAUSE OF HEAVY DEW, BUT MUST BE HUNG ON FENCES, ROCKS, OR SHRUBS TO CURE

Activity:

1. Build drying racks with sticks and twine. Hang cut grass up to dry. Compare length of time it takes grass to dry on racks and on the ground.

Concept B. MOUNTAINOUS COUNTRIES HAVE GREAT VARIATIONS IN TEMPERATURE, DEPENDING ON ALTITUDE

Activities:

1. Experiment with micro-climates. Take temperatures at the bottom, middle and top of a hill, and compare the findings. Discuss how high mountain heights would affect temperature.
2. Take temperatures on various sides of your school building at the same time. Compare your findings and relate this with the north, south, east and west sides of a mountain. On which side does Mr. Sun shed most heat and light?

Unit III - Life In The Cold Regions

Concept A PEOPLE OF COLD REGIONS PROVIDE FOR THEIR BASIC NEEDS FOR FOOD, CLOTHING AND SHELTER BY USING MATERIALS AVAILABLE IN THEIR AREA

Activities:

1. Build an igloo actually using blocks of snow. Blocks can be cut with a ruler or thin piece of metal shaped like a blade. You may also use styrofoam or sugar cubes glued together.
2. Go on a field trip to a frozen pond to demonstrate climatic conditions in cold lands. Notice the state of plant life.
3. Using bars of soap and scissors, carve different objects related to the unit, such as kayaks, little animals or igloos.
4. Write and produce a play about such topics as: "Preparing for and going on an Artic bear hunt".
5. Write to the embassy of a country in the region you are studying. Also the Department of Interior, Juneau, Alaska has information you may use.

Unit IV - Hot, Wet Regions

Concept A HOT, WET CLIMATES PRODUCE RAPID GROWTH OF VEGETATION

Activities:

1. During a period of warm weather, keep a plant moist and chart its growth periodically by placing a ruler by it. Compare this record of growth with that during a time when the plant gets little moisture.
2. Partly fill a gallon jar with soil. Plant some seeds or put in a growing plant. Close the jar and notice the humidity that develops inside the jar.

Concept B PEOPLE IN HOT CLIMATES NEED LITTLE SHELTER OR CLOTHING, AND USE MATERIALS AT HAND FOR CONSTRUCTING HOMES AND MAKING CLOTHES

Activities:

1. Dye yarn for weaving cloth. Use the cloth to make pieces of clothing.
2. Weave a mat from straw or strips of reeds or weeds.
3. Build a thatched hut out of reeds or weeds. Use string or wire to hold it together.

Concept C TOOLS AND WEAPONS ARE SIMPLY CONSTRUCTED OF MATERIALS EASILY FOUND IN THE ENVIRONMENT

Activities:

1. See Grade 4, Art, Unit I, Concept A, Activity 9. This is for making tools and weapons.

2. Study the history of tools and weapons. Make a time line showing the development, illustrating how certain materials have been used like stone or bronze.

Concept D RUBBER IS ONE NATURAL PRODUCT IN HOT, WET LANDS

Activities:

1. Have children examine dandelion, milkweed, or goldenrod for latex. Let drops of the liquid dry on the hand and see the sticky substance produced. When dry, this can be rolled into a tiny ball like rubber.
2. Make tapioca pudding and a pineapple fruit juice for a class party. It's nice to enjoy Social Studies, isn't it?

Unit V - Hot, Dry Lands

Concept A HOT, DRY LANDS ARE REGIONS OF LITTLE RAIN, FEW STREAMS, DRY SOIL, DRY AIR AND MUCH SUNSHINE

Activities:

1. Gather soil and combine it with sand. Let it bake in the sun. Notice cracked, dry surface. Relate the effect to the sun and heat on land. Pour water over it or set it in the rain. Notice soil erosion.
2. Dig into the soil to see how far you have to dig to find moisture. Help the children to realize that, in the desert, you can seldom reach wet soil.
3. On a field trip find a small ravine or a dry creek bed. Examine materials found in the creek bed and notice rounded pebbles; to demonstrate the effect of a cloud-burst on a dry creek bed pour two or three buckets of water at the same time down a small bare crack or crevice in the soil in the school yard. Notice the flood and head waters. Do the same demonstration on sod and compare the difference.

Concept B PLANT LIFE AND ANIMAL LIFE ON THE DESERT ARE VERY SCARCE

Activities:

1. Find a bare of sandy area on the school grounds. Only a square yard is necessary. Let the children observe the area for signs of life. Imagine the area into many

acres and relate scarcity of plant life in the desert. Compare these areas with a richly planted square yard. Record the differences of plant and animal life, and erosion.

2. Gather sandy, dry soil and make a desert terrarium. Plant a variety of plants in it. Do not water. Observe those which do not survive and those that do. Plant at least one corn and one squash seed.
3. Compare the discuss the farm practices and crops around here with those in desert regions. Consider type of crop and irrigation.

Concept C PEOPLE LIVING IN THE DESERT MUST HAVE SHELTER WHICH PROTECTS THEM FROM GREAT EXTREMES OF TEMPERATURE

Activities:

1. Use a thermometer to take the temperature of a sandy, bare area. Compare this with the soil temperature of a well-sodded area. Relate the difference to the need of shelter in hot regions.
2. Build a hogan or a typical Navajo settlement using sticks and mud.
3. Make scale or regular size models of open front tents like those found in the Sahara. Sticks and cloth need be the only materials used.
4. Experiment with white and dark clothing to determine heat absorption of each. A child wearing a white garment will feel cooler than one in a dark colored

garment because the white reflects much of the heat, while the dark color absorbs much of it.

5. Make crossword puzzles in the shapes of camels, sheep, or tents and hogans.
6. Prepare a TV program on a topic like "Life in the Desert".
7. Invite a resource person to come to show pictures and any special thoughts or display items available.
8. Indian pen pals may be established. Write to an Indian Reservation for possibilities.

Unit I - Vocabulary

Concept A READING AND VOCABULARY BUILDING STIMULATED BY OUTDOOR EXPERIENCES

Activities:

1. Take a "Five-Senses Nature Hike". Be quiet and look, listen, feel, smell, and even taste some objects on the hike. Keep an individual list to be shared with the entire class. Be sure to keep list of descriptive words that might apply to objects seen, heard, smelled, felt or tasted. Example: Soft-mass, clouds, dandelion or waxy-leaf, stem, bug, even coarse-bark, paint, rock.
2. On a trip to a creek or river discover objects relating to temperature like hot, cold, damp, clammy, moist, dry, wet, cool, lukewarm, etc.
3. Write to the National Audubon Society, 1130 5th Avenue, N.Y., N.Y. They have a program by which your children can become members of the Junior Audubon Society and receive membership pins, booklets, and pictures.
4. During the school year keep card dictionary of new vocabulary words, such as gall, tendril, terminal bud, or arbor can be used in creative writing. These cards may be hung on a string for visibility.
5. Make up a word meaning quiz to recognize the correct meaning of Nature words. Example: A grasshopper is a

"coniferous animal?" No! A pine tree is a "carnivorous" specie? No!

Concept B ORGANIZING INFORMATION CAN BE STIMULATED BY OUTDOOR EXPERIENCES

Activities:

1. Begin a walk with this list:

   We saw . . . . .

   We heard . . . . .

   We felt . . . . .

   We smelled . . . . .

   We tasted . . . . .

   After coming back to the classroom have them make their statements more meaningful. Example: We smelled smoke that was polluting the air.

2. On a trip to the park or even in the school yard let each child lay out a "square foot of ground" using string. Categorize the various forms of plant and animal life found in the square foot. Also classify the non-living material in this square.

Unit I - Measurement

Concept A MEASUREMENT IS EVERYWHERE

Activities:

1. Cut a pile or cord of wood. What is a board foot? Split pieces to estimate fractional parts.
2. Determine the age of a tree by counting the rings.
3. Estimate elapsed time periods of half-an-hour or longer by observing and marking changes in the length of the shadow of trees or other objects, or by constructing a simple sundial.
4. Use the "stick method" to estimate the height of a tree. Have a child of known height stand at the foot of a tree. Then have another child move back about 100 feet. Each should hold a stick vertically at arm's length, in front of himself, and use his thumb to mark off on the stick what appears to be the height of the child standing at the foot of the tree. Finally, seeing how many times he can measure this distance on the tree, each child can make a good estimation of the tree's height.
5. Use the "12 to 1" Ratio Method" of measuring a tree. Starting from the base of the tree, walk 11 paces and push a stick into the ground. Continue one pace further and place a mark. At this point have a person lie on

the ground and sight with the lower eye. He should project a line past the stick (or yard stick) to the top of the tree. The height of stick where the projected line passes in inches is the height of the tree in feet.

6. Compare lengths of shadows to find the height of a tree or telephone pole.
7. Learn the pacing method of estimating distances of the ground. Measure 100 feet on the school yard. Have each child walk this distance many times, counting his paces. Then have him average the number of paces used in walking 100 feet. By dividing 100 feet by this average each child can find the normal length of his pace.
8. Do work with personal measurements. Use these in judging heights and sizes outdoors. Here are some of them:
    a. Length of arm from elbow to end of longest finger.
    b. Height to top of head.
    c. Height of shoulder or eye.
    d. Height to top of hip.
    e. Height to upward reach.
    f. A one-inch distance on finger.
    g. Length of shoe or foot.
    h. Length of arm.
    i. Handspan
    j. Length from nose to end of outstretched arm.

Concept B GRAPHS ARE A USEFUL WAY TO RECORD INFORMATION

Activities:

1. Graph data collected on projects. Examples: Temperature changes during each month of school year, rainfall average, and types of birds visiting the school bird feeder.
2. Make paper airplane models. Fly them outside. Measure distance of each flight and record on bar or line graph. Compare different shapes of airplanes.

Unit I - Art in Nature

Concept A NATURE OFFERS MATERIALS AND INSPIRATION FOR MANY ART EXPERIENCES

Activities:

1. Look for shape and form in nature objects. Discover variety of shapes and forms (seed, leaves, fruit, twigs, animals, etc.)
2. Record the number of colors which can be observed in small areas and try to duplicate them with paints.
3. Gather dried grasses and other plants to make decorative arrangements.
4. Find clay (natural) for modeling.
5. Experiment with branches, feathers, bones, grasses, seeds or other naturals, as paint brushes to create various effects such as massiveness or delicateness.
6. Use tumbled rocks to make key rings, jewelry, or mobiles.
7. Use different kinds of rock to "paint" pictures on sand paper.
8. Make paper-mache dinosaurs.
9. Make weapons, instruments, and weave mats to typify utensils used by caveman. Examples: sticks, twine, stones, arrows, clubs, blow-guns, etc.
10. Saw a piece of branch at each end. Drill 3/4" size holes in the branch at different levels. Place three

pecans in the holes. Paint squirrel faces on them. Build a 1" base for the branch and nail base on. Shellac entire figure.

11. Gather objects such as wood bark and seeds to make a nature collage.

12. Make ozalid (light-sensitive or architect paper) nature prints. Obtain ozalid paper from a craft center. Keep it well protected from the sun. Set up a gallon jug and put a small jar of ammonia in it. Cover tightly. Take a sheet of ozalid paper and place on it a leaf, flower, or other flat object. Put sheet on a book or cardboard. Cover with a piece of glass. Be careful not to touch the sheet, hold it from underneath. Hold the sheet in sunlight (direct) and count to ten. Quickly take the glass and leaf off sheet. Slip the sheet into the gallon jug. Wait until print changes color. Remove and frame.

Unit I - Nature's Expression Can Be Musical

Concept A MUSIC IS AN EXPRESSION OF NATIONAL CHARACTER

Activities:

1. Have children learn and perform dances native to lands studied in Social Studies. Many of these dances are more effective when performed outdoors. Examples: Indian Rain Dance, Native Rhythms of the Amazon, Native Rhythms of the Congo, Dutch Dance, etc.
2. Make up new lyrics to familiar tunes, using nature knowledge acquired from field trips. Popular songs go over big.
3. Tape record rhythmical sounds from outdoors. See if children can identify sounds as tape is played back.
4. While on hikes or field trips whistling, humming, and singing divert the energies of over active children.

Unit I - Safety

Concept A <u>OUTDOOR SAFETY IS VERY IMPORTANT</u>

Activities:

1. Search for a growing grape vine. Cut for moisture.
2. Collect wild blackberries, blueberries and raspberries. Clean and sample.
3. Survival units are a lot of fun. A Boy Scout fieldbook is handy for complete list of edible plants for this unit.
4. Search for dandelion leaves. Collect and boil the leaves. Cool. Make a salad with the leaves. Salad dressing makes it more tasty.

Unit II - Games

Concept PHYSICAL AND MENTAL SKILLS CAN BE DEVELOPED THROUGH OUTDOOR GAMES

Activities:

1. It - All players, except the one who is "It", sit in a circle. He who is IT leaves the circle and goes to a place where he cannot hear or see who is chosen as the leader. The leader starts a motion with any part of his body and the other players immediately follow. The IT player is called back in. He tries to guess who is starting the different motions made by the group. Players try to follow quickly and look at different players other than the leader. When IT guesses the leader (4 tries), he may choose a new leader after the old leader leaves to become IT.
2. Pebble Hunt - Two teams sit facing each other. Team one has a pebble which is passed from one hand to another or pretended to be passed from one to another. The other team is watching all this motion. The passing team may make all the gestures it wishes to deceive the watchers. The captain of the watchers yells, "Stop" and all passing stops. He will then ask to see the contents of the hands one at a time. The object is to guess where the pebble is as quickly as possible. The passers get

as many points as there are open hands (wrong guesses). If it is guessed the first time, no points are scored for the passers. Watchers get the pebble after they find it and the game gets started all over again.

3. Turn Around Indian - Every player stands with his feet together with four four-inch sticks on the back of his hands. On a given signal he throws the sticks up in the air, turns a complete circle (quickly) and catches as many as he can. This can be done with more or less sticks depending on the skill of the child.
4. Nut Relay - Place a large number of acorns in a basket about 15 feet away from any number of teams you want to have. When the "Start" signal is given, each child from every team (one at a time) runs up to the basket and gets as many acorns as he can carry on the back of one hand. At the end of each line a large grocery bag can be used to collect the nuts. The nuts that fall off on the way back remain on the ground. When every child has had his turn or when all nuts in the basket are gone, the team with the most nuts wins.
5. Shadow Tap - This is played like regular tag except the person who is IT must step on the shadows of the person he is chasing. Learning to control the length of your shadow is important.

Grade 5
Science
Unit I

Unit I - The Earth and It's History

Concept A THE EARTH IS COMPOSED OF THREE LAYERS, THE CRUST, MANTLE AND CORE

Activities:

1. Mix mud with water and sugar and/or sand until mixture is thick but moist enough to be manageable. Shape into balls or spheres and cut out a moveable section. Let dry and then paint layers representing crust, mantle, and core.
2. Make pictures with labels of the three layers.
3. Do activity on p. 22, Concepts in Science 5.

Concept B ROCK FORMATIONS ARE OFTEN FORMED IN LAYERS UNDER WATER

Activities:

1. Have each child bring in a jar. Gather sand, dirt and gravel. Pour into jar of water, shake, and let settle into layers. Have them keep these and refer to them periodically throughout the year for increased hardness.
2. Take a field trip to observe huge layers of exposed rock.

Concept C THERE ARE THREE GROUPS OF ROCKS - IGNEOUS, SEDIMENTARY AND METAMORPHIC

Activities:

1. Collect various rock samples during field trips. Classify

page 128 blank.

according to size, color, and materials. Identify.

2. Rub two ricks together to see which makes a scratch on the other. Testing for hardness can also be used with a chart and tools (e.g. glass, penny, fingernail or nail). Streak plats can be obtained from the Jr. or Sr. High School for this activity too.
3. Test for limestone - vinegar, lemon juice, or diluted hydrochloric acid when applied to a piece of limestone will bubble on the surface.
4. Guessing game: Collect rocks around the schoolyard and study closely. Blindfold each child and give each a rock. Have them describe the rock and try to guess which rock it is.
5. Examine a rock with a hand lens to see the size of particles. These may be crystals.
6. Activity on p. 38, Concepts in Science 5.
7. Find rocks that show signs of rusting.
8. Look for rocks in or around creeks that have been smoothed or rounded by the action of water.

Unit II - The Earth Is In Constant Change

Concept A MANY DIFFERENT FORCES ARE CONSTANTLY CHANGING THE EARTH'S SURFACE

Activities:

1. Find rocks that have been worn smooth by weather. Example: rain, river. Compare a freshly broken surface (hammer a rock open) with a weathered surface.
2. Find plants that are growing on, in, or near rocks and as a result are breaking, cracking, or splitting them.
3. Make mineral soil by rubbing two rocks together. How does nature do this for us?
4. Collect samples of man made rock (concrete, brick, glass, tile, plaster) and compare them with rocks that the earth has made.
5. With the use of a hand lens observe sandstone, limestone, quartz, salt, shale and other kinds of rock for likenesses and dissimilarities.
6. Wet some shale. Does it smell like wet mud? How do you suppose it was formed?
7. Follow a gully to see how deltas are formed.
8. Invite a resource person in to show slides of land forms that the children are not able to visit.
9. Break up a mixture of rocks in a cloth bag to determine types of crystals that make up these rocks. Use a

microscope and examine properties.

10. Obtain containers made out of different materials (tin glass, plastic, aluminum, iron, cardboard, steel, brass, rubber). Fill these with water and place them outside in cold weather (below 32 degrees F. - 0 degrees C). Note in which container the water freezes first. Why would each container have a different effect on the freezing time of water?
11. (Cont. of No. 10) What would be the result of placing tight covers on all of these containers and doing the same thing? Pressure and power exerted by freezing water forces the covers off or bursts the container. Point out (if it can't be shown) that freezing water is responsible for broken radiators (cars); chunks of cement broken off playground, sidewalks, and driveways; shifts in position of buildings, playground apparatus, and highways; and rocks that break and crumble in the process of producing soil.
12. The same experiment can be done (10 and 11) by using different liquids (vinegar, alcohol, kerosene, oil). The power and devastating force of nature is tremendous.
13. Build a volcano using clay about 1 pound. Label the parts and discuss the cause of volcanic eruptions.
14. Classify rocks, according to hardness, luster, color, and texture.
15. Make sedimentary and conglomerate rocks.

16. Make a display of rocks, and minerals and list the ones we eat versus the ones we wear.

Concept B SOIL IS A RESULT OF MANY FORCES

Activities:

1. Fill a crack in a rock with water and put it in the freezer. Examine it after it freezes.
2. Plant a grain of seed in a crack of a rock. Leave for several days to observe how plants are able to break rocks into small particles of mineral soil.
3. Examine lichens to see how acids crumble the surface underneath. You can even compare it to another rock surface.
4. Soak limestone or sandstone in water for one-half hour. Put rock in jar of water after examining it first. Now allow each child to shake it eight times. Let the jar stand, and now let them make observations. Has there been a change in the rock, the water? Why? How would we relate this to rain or running water? I see in nature superforces. Learning to grow in appreciation of them is exciting.

Unit III - The Universe

Concept A <u>OUR SOLAR SYSTEM IS COMPOSED OF THE EARTH, MOON, PLANTETS, METEORS, COMETS, AND ASTEROIDS WITH OUR SUN AS THE CENTER</u>

Activities:

1. Look at the moon through a telescope or binoculars. Observe the craters and the mountains.
2. Observe sky on a cloudless night. Notice difference between "twinkle" of stars and the steady glow of planets (Mars).
3. Take pictures of the night sky with a camera. Using constellations is best in this activity. The Big Dipper, Orion, and Cassiopea are the easy ones. Learning stories and legends about constellations can be fun.
4. Finding the North Star using the pointers in the Big Dipper can be a valuable experience.
5. Divide the class in groups. Let each group take a planet and report on it. Tell them they must plan a trip to their planet. The children must design a space ship, space suits, food and equipment for landing, taking into consideration the characteristics of this planet.
6. Make scale models of the solar system.
7. Play games to illustrate the earth-moon relationship. Go out on the playground. Let someone represent the moon and two children holding hands be the earth. At

a good distance away, let the class and teacher gather in a circle and represent the sun. The two earth children walk around the sun (class). Remember this should be at a great distance. The moon child walks around the two earth people keeping the same side to the earth. This distance and the space available on the playground. Earth distance to moon is 250,000 miles -- earth distance to sun is 93,000,000 miles.

8. Plan a sky watch to observe meteor showers.
9. Make a model planetarium (see p. 123 in science text - Concepts in Science.

Concept B OUR SUN IS ONE OF MANY STARS AND CREATES ITS OWN LIGHT

Activities:

1. Using great care, observe the sun with the use of a telescope and sun filtering lens.
2. To show how the earth moves around the sun, observe shadows at different times of the year.
3. With a ball of clay, put tooth picks in the ball and explain that luminous objects produce their own light.
4. One of the better activities that children will remember is a sunrise. Go to a hillside or open field. Obtain information as to when the sun will rise and arrive there twenty minutes prior. Note the color that can be seen before the sun rises. Notice how swiftly the sun rises compared to how slowly it seems to set. Observing the apparent change in size as it rises.

Give the teacher an opportunity to discuss refraction of light. Warn the children not to look directly at the sun because of serious damage that might be done to the eyes. Explain.

5. A simple sundial can be made easily by driving a two foot stake into the ground in a place that the sun will be shining all day. The board should be driven in so that it angles and points toward the North. The angle is determined by the latitude of the location (41 degrees North for Elgin), but let the kids find this and determine the angle. Use small rocks and stones to mark every hour and half-hour. Use "sun time" (standard).

Unit IV - Plants

Concept A PLANTS ARE CLASSIFIED ACCORDING TO THEIR STRUCTURE

Activities:

1. Use a magnifying lens and a microscope, study molds, algae, fern spores, mosses, puff balls, toad stools, and lichens.
2. Compare conifers and deciduous trees for similarities and differences.
3. Smoke prints of leaves may be easily made by following the steps shown below:
    a. Cover bottle (round and smooth) with a thin layer of grease or vaseline.
    b. Fill with cold water and cork it lightly.
    c. Hold bottle over a candle flame until it is covered evenly with soot.
    d. Place a leaf, vein side up on a layer of newspaper and roll the sooty bottle over the leaf.
    e. Remove the leaf and lay it vein side up on clean newspaper.
    f. Cover leaf with a sheet of white paper.
    g. Roll over the white paper and leaf with a clean round bottle or other roller.
4. With a safety razor blade, make the thinnest possible shaving from freshly cut pieces of cork, bark, tomato,

apple, and celery stalk. Look at the plant shavings with a magnifying glass and microscope.

5. Observe the cell structures of elodia (water Plant) with a microscope and magnifying glass.
6. Make a clue chart for trees.
7. Make a chart or display of the classification of plants (using examples is good).
8. Skeleton of a leaf. (See p. 162 - Concepts in Science 5).

Concept B PLANTS RANGE FROM SIMPLE (ALGAE) TO COMPLEX (TREE)

Activities:

1. Study a shovelful of soil from the woods and list the plants that grow in it.
2. Collect "scum" from a pond and examine it with a microscope and magnifying glass.
3. Put paper on top of a stump and rub a crayon or soft pencil lead across to obtain pattern of growth rings.
4. Observe the differences in patterns, textures, and colors of bark. Smoother barks may be printed as in number 3.
5. Gather mosses, liverworts, and ferns. Use a microscope and magnifying glass to observe the cell structure of these plants.
6. Observational activity. Have each child select a plant, or even better, a part of a plant, (outdoors) like a bud. Each day have the child observe the plant for five minutes. Have him report in writing anything that happens to his plant or changes that occur. Have him measure any

growth. Continue this activity for several weeks.

7. Have students compare results of activity number six. Small plants versus large plants.

Concept C GREEN PLANTS MANUFACTURE THEIR OWN FOOD

Activities:

1. Observe how leaves are arranged in pairs or alternately so that each leaf gets sunlight.
2. What happens to a geranium leaf in light? (See pp. 234 and 235 - Concepts in Science 5).
3. Observe the Irish potato, bean seed, tulip bulb, onion or rhyzome of iris to see how they shrink and wither as the plant grows and feeds on it. (Bean growth is easiest).
4. What happens to a sealed-in plant? (See p. 239 - Concepts in Science 5).

Concept D WATER AND CARBON DIOXIDE ARE RAW MATERIALS NEEDED FOR PLANT GROWTH

Activities:

1. Place an air tight plastic bag over a twig. What happens?
2. Put a stalk of celery in colored water. What happens?
3. With a magnifying glass examine the stoma in leaves. Bring some back to the classroom for microscopic examination.
4. Pull up a few weeds, flowers, or part of the root to a tree and examine the root hairs. These absorb the water.

Concept E THE SUN'S ENERGY IS NEEDED FOR PLANT GROWTH

Activities:

1. Use a cardboard box to cover grass, a paper bag to cover a healthy plant, and a paper bag to cover a small branch bearing leaves. Observe every day; record data. (After coloration change, take off bags and cardboard to see if they turn green again.)

No.	Days	Grass	Plant
1			
2			
3			
4			
5			

2. Plant a class garden (flowers, beans, ferns, corn, and peas work best). Cover a select group of the plants with paper bags and observe differences in growth of plants that are covered and those that are not covered.
3. Test plants for starch (see pp. 234 and 235 - Concepts in Science 5).

Concept F IN CONSERVATION, PLANTS PLAY AN IMPORTANT ROLE

Activities:

1. Find an example of erosion near the school and use conservation practices to prevent erosion.
2. Take a trip. Notice the soil covering where erosion is extreme. Compare this with places where erosion

is slight.

3. With a couple of shovels, pile a large mound of dirt up and pack it down (1½ - 2 feet). Take a sprinkler or hose (light shower) and run the water over the mound. Note results.
4. Test soil for characteristics (see Tips and Tricks, pp. 86 - 89).
5. Using the class garden (Unit III, Concept 2, Activity 2), use varying amounts of fertilizer on similar plants. Observe effects.

Unit V - Animals

Concepts A ANIMALS ARE CLASSIFIED ACCORDING TO THEIR STRUCTURE

Activities:

1. The life in a drop of pond water (see p. 170 - Concepts in Science 5).
2. Collect parts of animal skeletons and compare.
3. Visit a museum to see mounted specimens.
4. Examine insects for the spiracles on the abdomen. Compare with other anthropods.
5. Take a trip or hike in the woods or around the school. Have the children write down the names of all animals they see, no matter how small. After they return to the classroom, have the children classify the animals according to their own groups. Example: large and small, backbones and no backbones, fly and cannot fly.

Concept B ANIMALS MAY BECOME LARGER AS THEY GROW OLDER OR MAY CHANGE FORM COMPLETELY

Activities:

1. Collect frog eggs at a pond. Keep them in an aquarium and observe changes in appearance (see p. 177 - Concepts in Science 5).
2. Gerbils are very easy to work with in the same way. The object of the last two activities is to observe growth maturity of various animals.

3. Display snapshots of children in class to show changes in growth.

Concept C MAN HAS A RESPONSIBILITY TO PRESERVE WILDLIFE

Activities:

1. Prepare feeding stations for birds and squirrels. In schools where materials are available maybe a photo album or even a movie of the animals using these stations could be made.
2. Visit a game preserve (McGraw Wildlife).
3. Improve a wildlife habitat by planting food and shelter plants.
4. Invite a game warden or equivalent to explain laws, stocking fish, habitat improvement, and other wildlife practices.
5. List nearby state parks and reserves. Encourage children to visit them. A field trip might be possible.
6. Visit a body of polluted water (Fox River) and explain how some pollutants endanger the life of many animals.
7. Have the children do research on local garbage laws. Then have the janitor come in and explain how trash is disposed of at your school.
8. Visit a local farm and have the farmer show and explain the number of chickens hatched each year versus the number of calves born each year. Relate this to the state laws regulating the number of larger animals killed each year versus the number of smaller animals.

Example: one deer per year per license, five squirrels per day, five rabits per day. Deer season lasts approximately three and one-half months. It is therefore possible to kill many more rabbits and squirrels than deer. Why is this so? Why do we have laws regulating the number and time of year that wildlife can be killed?

9. To add to the unit on man's responsibility to wildlife, relate this to environment and have a clean-up campaign in and around the school grounds.

Unit I - Colonial America

Concept A THE EARLY SETTLERS IN AMERICA FOUND AN ABUNDANCE OF NATURAL RESOURCES

Activities:

1. Make flour, collect seeds of barley, wheat, oats, or even grass. Wash two smooth rocks with soap and dry them and the seeds in the sun. Grind the seed as best you can, then sift the grindings to separate flour from seed covering (bran).
2. After activity, one of the children could make cereal, bread, or pancakes.
3. Visit a wooded area (parks, forest preserve, etc.). Discuss whether or not this would have been a good place for pioneers to live. What makes it so? What materials would they have used to build a home there? What kind of natural resources are available at the site? What would you hunt or fish for food? What crops might be grown? What might the kids wear at different times of the year? Remember that you are an early settler at this particular location.
4. Visit a water mill (Old Graue Mill - see resources) to see wheat and corn being ground into flour and meal.
5. Construct maps of what the children think the school ground might have looked like one hundred years ago.

6. Gather dried grasses, flowers, pussy willows, and other plants and make arrangements that early settlers might have made.

7. Many household articles and tools can be made. Example: pitch fork, spoon, harness.

Concept B MAN'S EARLY HISTORY BRINGS AWARENESS AND APPRECIATION

Activities:

1. Take a visit to a cemetery (this can be used for all subject matter).

   a. Discover local history recorded on the grave stones and surroundings.

   b. Record the following:

Name	Birth	Death	Age

   c. In what years did most people die? Why?

   d. During what age group did most people die? Why?

   e. How many people were born in a foreign country? What countries are represented?

2. Begin a project of weaving, knitting, and quilting. Give the children a choice as to which activity they would like and make it a year long project.

3. List some of the natural resources wasted by early Americans that moved westward.

4. A visit to a museum would be very appropriate here.
5. Find out what the main products are of the Elgin area. What was or might have been the products of main interest one hundred years ago?
6. What are the main occupations of Elgin? Are they varied? Why? What were they one hundred years ago? What caused these changes?
7. Personify a very old tree - one that was planted by the earliest settler in the Elgin area. Discuss some of the "neighbors" (people, animals, plants, natural resources) he has in his life time. Example: use of the land area over the years.
8. Obtain some old tools and find out how man used them.
9. Visit a place of geographical or historical interest (Indian mounds, historical societies, monuments, etc.).

Concept C <u>COLONIST HAD THEIR OWN IDEAS ABOUT RELIGIOUS FREEDOM AND SELF-GOVERNMENT</u>

Activities:

1. Have a "mock" presidential election. Use controversial issues of the time.
2. Many religious groups settled in certain areas. Make a map of the United States and color code it using religious groups as the theme. Examples: Catholics, red; Mormons, blue, etc.). Which ones were subjected to abuse in the United States? Why? Where?
3. Organize a class council using representatives from each of the fifth grade classes. Discuss qualifications

of a good representative. Have the children nominate candidates and elect representatives by ballot. After each council meeting, the representative may report to the class and secure group's criticisms and suggestions.

4. At this time, take the children outside and show how the British fought in a battle as opposed to the Colonist (Indian style). Divide the class into two groups, one British and the other Colonial (America). The "red coats" stayed in regiments or straight lines. Usually with two or three lines backing up the first one and they they rotated. The Colonist learned to fight like Indians; hiding, trenching, hilling, and hit running.

Unit II - United States Geography

Concept A THERE IS A VARIETY OF RESOURCES AND GEOGRAPHY IN THE UNITED STATES

Activities:

1. Visit a rock quarry.
2. Visit a water purification plant.
3. Visit a farm that has a wheat field. Let the farmer explain what is necessary for his wheat yield. Trace this grain to the bread in a bakery. A visit to the bakery is good here too.
4. Trace iron produced in Minnesota to the metal used in an automobile.
5. On a map, color code the major mineral resources of the United States.
6. Locate the larger river in the United States on a map. Circle the number of cities that you have heard of that are located on these waterways. Is Elgin area one? Where were the first homes located in the Elgin area?

Concept B ILLINOIS AND THE ELGIN AREA HAVE AN INTERESTING HISTORY

Activities:

1. Visit a local cemetery.
    a. Compare dates on headstones as to wars, diseases, plagues and early settlement into the Elgin area.
    b. Discuss burial customs and problems. (Indians also).

c. What different nationalities are represented within the cemetery?

2. Show the location of the early towns, state parks, forests and early trails on a map of the state.
3. Go on a general observation hike to observe different types of wildlife in the area.
4. Give a dramatization of the Lincoln-Douglas Debate outside on a log or small homemade platform. Have the class take sides.
5. Draw a large travel map of Illinois showing points of interest. Mark sections of the state known for mining, farming, industry, exports and travel.
6. Gather information on temperature and rainfall for thirty days. Find the average of each.

Unit III - Map Skills

Concept A. KNOWLEDGE AND USE OF THE COMPASS LAYS A FIRM FOUNDATION FOR BASIC MAP READING SKILLS AND UNDERSTANDINGS

Activities:

1. Learn parts of a compass: degrees, magnetic needle, housing, base, direction of travel arrow.
2. Play game to aid in understanding compass points. Participants line up, an arm's length apart. Locate North with a tree or other landmark. On signal - "Northeast Go" - all turn to what they believe to be Northeast; then on command, "Freeze", stand motionless. Those who are facing correctly three times can go to another compass or mapping activity. Others continue game to get more training.
3. Use compass. Each team should start at a given point and determine from there the degree readings of school landmarks. They may wish to record this on simple maps.
4. Orienting map walk. To "orient" a map means to turn it so that North on the map fits the actual landmark at which he is standing. He may wish to do this more than once, using more advanced maps each trip.
5. Take a map point walk. On a simple map, lay out an appropriate route leading through easily definable

landmarks. Mark the route by crepe paper streamers so each marker can be seen from the preceeding one. Place North pointing arrow marker at each landmark to assist children in orienting their maps. The object is to follow the marked route and indicate on the map, by circling each of the landmarks. A judge at each landmark could help those that need it (Boy Scouts are excellent for this purpose.)

6. Make secret individual compass maps, exchange and follow directions.

Unit I - Creative Expression

Concept A OUTDOOR EXPERIENCES MOTIVATE CREATIVE WRITING

Activities:

1. Describe objects seen outdoors and write on paper.
2. Draw a line down the center of the paper. On the left, list objects that you can see or feel. On the right, list words which describe each object.
3. Write poems, diaries, logs, newspapers, stories, songs and menus.
4. Keep an outdoor experiences word dictionary. All new words or terms should be kept in this dictionary.
5. Compose some Tanka poetry. This is Japanese poetry. written about the seasons. It consists of five lines. There are five syllables in the first line, seven syllables in the second line, five in the third and seven in the fourth and fifth lines.
6. Let children develop their imagination through written interpretation of the events of a hike in the form of a tall tale.
7. Keep field notes.

Concept B OUTDOOR EXPERIENCES MOTIVATE CREATIVE EXPRESSION

Activities:

1. Describe objects outside orally.

2. Dramatize action out-of-doors by use of verbs (waddle, hop, leap) and also adverbs (swiftly, quickly).
3. Do charades - use new additions to vocabulary from the outdoor education dictionary (see activity 4 Concept A Unit I). After each charade has been guessed, the members of the class might record spelling and simple definitions.
4. Review an outdoor activity by preparing an "on the spot" T.V. or radio program (see IMC or WEPS Director).
5. Have conversation between two characters (perhaps a deer and a hunter or an eagle and a robin).

equipment needed. Visit a sport shop and itemize each piece of equipment. Find total cost.

11. Plan a compass hike.

Concept B RATE AND RATIO ARE METHODS OF COMPARISON

Activities:

1. Fraction and whole numbers:
    a. Take a tree census; determine the total number of trees in an area. Determine the fractional part of the total for all of the kinds.
    b. Count the number of brick in one row along one side of the school building. What part of the row does each brick make up? What part of the row do five bricks make up?
    c. Use sticks, stones, leaves, branches, etc. to demonstrate fractional part of wholes or groups.
    d. Using a bucket of sand, water, dirt, etc., show fractional parts of volume.
2. Figure the rate of flow of a dripping faucet (p. 341, 5th grade math, Addison-Wesley).
3. How fast can the children walk, run, roller skate, ride a bicycle? (p. 341, 5th grade math, Addison-Wesley).
4. Chart the rainfall over a given 30 day period and find the average.

Unit I - Measurement

Concept A MEASUREMENT IS EVERYWHERE

Activities:

1. Measure the perimeter of your school site.
2. Measure the circumference and diameter of a tree and compare.
3. Measure surface areas to make a map to scale.
4. Draw a scale plot for the school garden.
5. Pace off an acre. Each child will need to know what the average length of his pace (double step) is.
6. With the use of a Biltmore stick find the number of board feet in a tree.
7. With the use of compasses and protractors find the slope of a hill.
8. Find a friendly neighbor around the school with a fenced in yard. Tell the children the total number of posts in the fence. Give them the measurements by scale on the board. Now let them figure out where they would put the posts. Visit the yard and let them compare their results with the neighbors fence.
9. On a geometry hike let them draw figures for every geometric design they see (stop sign, stop light, tree, telephone poles, houses, etc.).
10. Plan an outdoor camping trip. Have the children list

5. Chart the temperature and find the average over a 30 day period. Compare different months and seasons. Make this a year around activity.

Concept C THE CEMETERY HAS LOTS OF MATHEMATICS

Activities:

1. Subtract the birth year from the death year to find the age of the deceased.
2. What fraction of the people were born in the 19th Century? 20th Century?
3. What fraction of the people died in the 19th Century? 20th Century?
4. Group the ages of the people whom you have recorded.

0 - 10 _____	31 - 40 _____	61 - 70 _____
11 - 20 _____	41 - 50 _____	71 - 80 _____
21 - 30 _____	51 - 60 _____	81 - 90 _____
	over 90 _____	

5. Various activities can be done with the results of activity number 4 (example: percentage, ratio, fractions, addition and subtraction).
6. Make a bar graph showing the kind of stone used for the grave marker.

Type of Stone	1	2	3	4	5	6	7	8	9	10
Granite										
Marble										
Limestone										
Cement										
Metal										

Unit II - Geometry

Concept A MANY OBJECTS HAVE GEOMETRIC SHAPES

Activities:

1. Find and name geometric shapes in nature around your school. Example: rocks, feathers, trees, leaves, branches, eggs, berries.
2. Have a "geometric figure week". Use figures like circle, square, triangle, and rectangle and place the figure of the week on a bulletin board. Have the children bring or draw pictures of objects seen outside school that relate to these geometric shapes.

Unit III - Compass Skills

Concept A KNOWLEDGE AND USE OF THE COMPASS HAS MANY MATH VALUES

Activity:

1. See Grade 4, Social Studies, Unit III, Concept A, Activities 1, 2, 3, 4, 5 and 6.

Unit IV - Maps

Concept A THE LOCATION OF PLACES AND THINGS CAN BE SEEN PICTORIALLY IN MAPS

Activities:

1. Use a compass to determine direction.
2. Become familiar with landmarks around your school by determining their direction.
3. Make a compass trail or treasure hunt.
4. Design a map (to scale) of the school site or nearby area.

Unit I - Nature is an Artist

Concept A THE USE OF NATURAL ART MATERIALS INCREASES INTEREST IN THE OUTDOORS

Activities:

1. Collect natural materials for a collage.
2. Locate a good tract that is clear and sharp in mud, dirt, sand, or snow. Make a plaster cast. Compare the products.
3. With charcoal or coal sketch or draw gullies, streams, forest, meadow, etc.
4. Weaving grasses, barks, reeds, etc. can produce interesting things like mats and wall hangings, etc.
5. Tree fungus carving is fun. This can be done with soft wood also.
6. Make drums, rattles, tom-toms, headdresses for an Indian dance.
7. Collect native materials to produce colors for painting and drawing.

Concept B NATURE CONTAINS MANY SCENES FROM DRAWING AND PAINTING

Activities:

1. During a nature walk, point out the various sizes of branches which reach out, spread, and cross one another. Have the children notice the repeated shapes of leaves. Draw these designs in pen and ink, then shade with brown

and green water color.

2. Find smooth, water worn pebbles to make pebble mosaics.
3. Make sketches in cartoon style of several natural objects as trees, flowers, plants, or animals.
4. Take photographs of nature and place different types of expressions underneath them. Place all of these phrased pictures on display.
5. Draw a tree without looking at the paper.
6. Making picture frames for the childrens drawings can be great fun.
7. Look for familiar objects in cloud formations. Draw the different cloud formations.
8. Painting, photographing or drawing the same scene in different seasons, or weather conditions develops great aesthelic appreciation.
9. Have the children design their own brand. Obtain from the lumber yard a one by ten piece of pine (a diagonally cut cross-section with bark, provides a rustic appearance; this will be hard to obtain, though). With a wood burning set, often obtainable from one of the children, have each child put his brand on the log. This can be done every year with a different piece of wood. Hang them up and keep them displayed all year around.
10. Saw one pine cone in half. Take one of the halves and fasten to a whole pine cone with wire. It will form a body and head. Make eyes of acorns or stones.

Unit II - Photography

Concept A TOMORROW, TODAY, AND YESTERDAY CAN BE SEEN IN PHOTOGRAPHS

Activities:

1. Using photographs students have taken, pictures from magazines, study prints, newspapers, etc. . . . ask the students to determine how the area in the picture will look a long time in the future . . . and how it looked a long time ago. Materials for this would be: the pictures, frosted acetate or tracing paper, tape, and pencils (regular or colored). Have the students fasten the acetate or tracing paper over the photograph and complete the assignment by making it look as it might have or shall in the future.
2. With Activity 1, try using photographs of environments that have a variety of abstraction. Examples: places far away, other countries, photos of the moon, places near home, inside your house, mars, etc.
3. Go outside and take a picture of power. Example: power lines, transformers, car engine, muscles, people lifting other people, a woman, etc. This assignment was intentionally ambiguous. Keep it that way and let the children use their imagination. Do it yourself.
4. Take a picture of something invisible. Example: sound, light, space, temperature, etc. For activities 3 and 4,

let the children exchange pictures and see if they can guess what is there. Every child cannot have a camera so maybe groups of five or six can do these activities.

Unit I - Nature is a Musician

Concept A THE SOUNDS OF NATURE ARE MUSIC IN THE PUREST FORM

Activities:

1. Collect objects of nature such as stones, seeds, sticks, gourds, dry grass, hollow reeds, etc., to make different sounds and rhythms. Examples: place grass or reed between thumbs, cup hands and blow to produce a whistle. Shake pebbles in a hollow gourd to make rattles. Strike sticks together to make rhythmical sounds. Wave tree branches bearing dried leaves in the air.
2. Have the children march, dance, skip, clap, or leap to the music being produced by instruments in Activity 1. They can do these things to drumbeatings, songs, and recordings also.
3. Have the children listen to morning sounds and night sounds.
4. The children that have cassettes could record these and bring them to school. It might be a good idea to have the parents help with this activity. Placing the microphone near a bird bath or bird house with volume turned up to maximum is best.
5. Imitate animal sounds. Have children bring sound devices used by hunters.
6. Compose songs based on outdoor experiences. Example: Creative lyric.

Unit - Outdoor Safety

Concept A OUTDOOR SAFETY IS AN IMPORTANT PART OF OUTDOOR LEARNING

Activities:

1. Observe the following rules:
    a. Stay with the group
    b. Avoid running
    c. Handle fire and heat with caution
    d. Transport tools carefully
    e. Avoid poisonous plants and animals
    f. Carry a first aid kit
    g. Use verbal and visual signals
    h. Drink only safe water
    i. Observe rules set up by the group

Unit II - Food and Nutrition

Concept A WHEN ENGAGING IN OUTDOOR ACTIVITIES, GOOD NUTRITION IS IMPORTANT

Activities:

1. On long hikes carry "emergency rations" like raisins, candy bars, carrots, apples, etc.
2. Learn proper procedures for cooking outdoors by planning a cook-out or lunch at the park.
3. Plan for an adequate water supply on long nature hikes.
4. Encourage wise selection of food for snacks and dinner on hike.
5. Use proper disposal methods.

Concept B GAMES PROVIDE A PLEASANT WAY TO LEARN

Activities:

1. Play - Who Am I. Have each child write on a slip of paper the name of an animal, tree, or some other living thing. Pin the slip on the back of another player. As soon as each player has a slip on his back, each child tries to discover his identity by asking the other players questions that can be answered "yes" or "no". When a player discovers who he is, his slip is removed from his back and pinned on the front of him.
2. Play - The ABC of Nature. Go outside and find an

object of nature for each letter of the alphabet. The one having the most complete list is the winner. You can do this with colors too.

3. Play - Touch Memory. Have a small group go outside and collect a number of different objects from Nature. Have one child pass behind the line of players, allowing each to feel and touch the object. Now see if they can identify it.

4. Play - Trees. Players sit in a circle, and are divided into two teams. The game starts when the leader spells T r e e. The next person must spell a tree that begins with the last letter, like elm, maple, evergreen, nyssa, apple, etc. This activity can be made easier by just having them spell an object in nature (e.g., seed, deer, rabbit, tree, etc.).

5. Play - Hold That Line. A small group of children hike single file. At short intervals a challenger points to some object of Nature which the leader must identify to hold his position as "leader". Failure to identify means the leader goes to the back of the line.

6. Other games to play:

    a. Capture the Flag

    b. Stalking a Deer

    c. Indian Corn Game

Unit I - Insects (Entomology)

Concept A THERE ARE MANY KINDS OF INSECTS

Activities:

1. Measure off a one-foot square of grassy area, and have small groups (perhaps 2 or 3) list the insects found there. A four-foot string can be used as a perimeter.
2. Collect and group insects according to the habitat in which they are found. (Wood, small stream, flowers, shallow puddles, vacant lot, trees, shrubs, under rocks, rotted log)
3. Collect insects for an exhibit of an insect zoo.
4. Give the class a list of 10 insects. Divide the class into groups for a scavenger hunt. Set a time limit.

Concept B INSECTS ARE CLASSIFIED BY THEIR BODY STRUCTURE

Activities:

1. Examine a grasshopper with a hand lens to find the three main body regions: head, thorax and abdomen. On the head look for antennae, compound eyes, and mouth parts. On the thorax look for the six legs and wings. On the abdomen look for the ears and the spiracles.
2. From a collection, study the specialized parts of insects.
    a. mouth parts - used for biting and chewing plant food, sucking plant juices and animal blood, scraping and wetting food, sipping nectar from

flowers, and sucking sap from trees.

b. legs - jumping, crawling, swimming, walking on water, burrowing, carrying pollen.

c. antennae - knobbed, elbowed, thread-like.

3. After capturing various insects, place them on a large sheet of paper. As you observe their moving about, record and classify them according to their traveling habits (crawling, flying, hopping).

Concept C INSECTS HAVE MANY SELF-PROTECTING ADAPTATIONS

Activities:

1. On a field trip try to discover several ways that insects protect themselves (coloration, giving off unpleasant odor, giving off smoke screen, pretense, disagreeable taste, rapid movement, flight, biting mouth parts).
2. Look for and identify insect homes around your school (indoors and outdoors). Protecting themselves may preserve some to continue the specie, and man is an enemy who must seek to protect each organism in his enivronment, since insects have little defense against him.

Concept D INSECTS UNDERGO METAMORPHOSIS (BOTH COMPLETE AND INCOMPLETE) AS THEY DEVELOP FROM EGGS TO ADULTS

Activities:

1. Collect caterpillars and put in a jar with air holes to observe metamorphosis of insects.
2. Search the school grounds for insects that undergo

incomplete metamorphosis, such as: aphids, termites, preying mantis.

3. Compare the life cycle of a frog with that of an insect.

Concept E SOME INSECTS ARE HELPFUL TO MAN, OTHERS ARE "HARMFUL TO MAN"

Activities:

1. Examine areas around the school grounds that might have been damaged by insects. Wood may be damaged by ants or termites. Possibly insects have eaten leaf material of trees or shrubs.
2. Observe, discuss, and study how bees are useful in cross pollination and in making honey. Make a visit to a farm with beehives.
3. Look for galls on leaves and stems of plants. Discuss the interrelationships of plants and these insects.
4. Visit a garden or farm with crop damage due to insects, and have farmer tell how they try to prevent insect damage. Insects do provide food for many small animals and birds.

Unit II - Birds (Ornithology)

Concept A BIRDS DIFFER IN MANY WAYS

Activities:

1. Use binoculars to observe the differences in beaks, feet, feathering, size and color. Discuss how these affect the life of the bird.
2. Make a bird clue chart and identify the birds by using the six "S's". Size, shading, shape, song, sweep (flight pattern), surroundings (habitat).
3. Make notebooks of bird watching experiences. Keep track of color, size, name, if possible; when and where?
4. Listen to records or tapes of bird sounds, then go outside to listen for similar bird sounds (early morning).
5. Make bird models or a bird zoo. Use clay, paper maché, or collage.
6. Use bird flash cards for bird identification.

Concept B BODIES OF BIRDS ARE ADAPTED FOR FLYING

Activities:

1. Take a trip to the field and woods to look for bird feathers. Examine feathers for strength, flexibility, smooth surface and light weight. Discuss how the tail feathers act as a stabilizer, brake, rudder, and ele-

vator. Use a microscope and hand lens.

2. Observe flight patterns of different birds (soaring, gliding, hovering, taking off, landing).
3. Examine the wing and breast of the chicken. Discuss how the wing operates in flying and how the breast muscles operate the wings for flying.
4. Compare the structure of a bird with that of an airplane. Nature has carefully planned for its needs.

Concept C BIRDS HAVE THREE KINDS OF HABITATS (WOODS, FIELDS AND WATERWAYS)

Activities:

1. Examine bird nests in the three basic habitats to see similarities and differences.
2. If nests of those birds which do not re-use theirs are available, determine the kinds of materials used in making them.
3. Record the birds found in the three basic habitats.
4. Identify shrubs, trees and other foods on which birds feed to direct observations to find birds feeding on these.
5. Some birds feed or insects. Discuss how this is helpful.
6. After observing the beaks of birds, discuss how the beak is designed to help obtain food. The class may make models of beak types. Birds survive better when their habitat is most suitable to them.

Concept D THERE IS A NEED FOR BIRD PROTECTION

Activities:

1. You may take a field trip to a bird sanctuary.
2. Set up bird feeders for winter feeding. Keep a record of birds feeding there and their food preference.
3. Plant trees, shrubs, flowers which have edible berries and seeds.
4. Lay out materials such as yarn, wool, cotton, straw or string. Observe the kinds of birds that use each of the materials. This should be done in April and May.
5. Have a local bird authority speak to the class on laws that protect birds, and bird watching as a hobby.

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Unit III - Soil Conservation

Concept A SOILS ARE A COMBINATION OF MANY THINGS

Activities:

1. Collect samples of soil from various places on or near the school grounds and observe living organisms and organic matter with a hand lens. Record the things found.
2. Dig down past the topsoil to examine samples of the topsoil and subsoil. Discuss the differences found. Compare a sample of parent material.
3. Put different types of soil in thin layers in a jar and add water. Then shake the jar to see which soil particles will settle first. Note layers. Discuss reasons for this.
4. Test the soil for acidity and various minerals by using a soil testing kit.
5. Show that soil can be made by chemical action, by dropping pieces of limestone into vinegar. Discuss how long it would take for weak acids in soil to break down rock into particles.
6. Take students to a forest area to observe decaying leaves, wood, and other vegetable matter. Discuss this type of soil formation.
7. Take the class to the mouth of a river or a creek to see sediment deposited there.

8. Examine roots of clover or alfalfa to find nodules which contain nitrogen-fixing bacteria.
9. Survey the school grounds for different types and colors of soil.
10. Find rocks with lichens growing on them and discuss their part in soil formation, as they slowly break down the rock.

Concept B SOIL IS A NATURAL RESOURCE

Activities:

1. Survey the school neighborhood to see how many different uses and misuses can be found.
2. Discuss the number of occupations dependent on the soil.
3. Have a soil conservationist speak on the importance of conserving our soil.
4. Write letters to the State Conservation Department for study and display materials or films.
5. Discuss the part in a food chain that soil plays (soil to plants to animals to humans to soil).

Concept C EROSION IS A SERIOUS THREAT TO OUR SOIL

Activities:

1. Place a clean piece of board in a grassy area and a bare soil area. Compare the amount of soil on each one after a heavy rainfall.
2. Search the school grounds for examples of gully erosion. Grass is beautiful.

3. Collect samples of water from a stream before and after a rainfall. Compare the samples after they have settled.
4. Measure the degree of slope of a hill. Discuss the effect of slope on soil loss. Help students to discover methods to reduce erosion. (Plant crops with thick root system.) Let pupils follow through on a logical plan to reduce erosion.
5. Discuss good farming methods such as: strip cropping, crop rotation, terracing, contour plowing, grass waterways, and cover crops. Then travel to farms to see these practices. Good soil produces healthy crops.
6. Fill two trays with fine soil. Tilt one end up. Cover one tray with sod. Sprinkle the same amount of water over each tray. Determine which tray loses more soil. (The grass roots hold soil in place, which in turn holds the water.)
7. Fill two trays with fine soil. Use a stick to make furrows up and down in one tray and across in the other tray. Tilt one end of each up. Sprinkle each with the same amount of water. Determine which tray loses more soil. (Contour plowing works this way.)

Unit IV - Sanitation

Concept A KEEPING THINGS CLEAN HELPS TO CONSERVE THEM

Activities:

1. Compare the appearance of dirty things with that of clean things. Indoors and outdoors. Which appearance is preferred?
2. Place an attractively decorated trash can in the school yard to make other children aware of the need to keep the school grounds clean.
3. Have an A-B-C scavenger hunt to clean up the play areas. Provide each team with a bag and have them find as many items on the playgrounds as possible, beginning with each letter of the alphabet.
4. Have teams make a creative picture with the litter picked up.
5. Clean out window or stairwells and study the contents. Would anything grow in the soil found? Try planting something like grass seed in the soil to see.
6. Observe corrosion, paint peeling, and oxidation (rust) around building. Discuss how this can be prevented.
7. Go outside with the class to clean up an area. Compare it to its previous condition and to the surrounding areas that have not been cleaned up. How do the children feel about having helped clean up?

8. On a winter day have children collect icicles to melt. Collect the water and look at the residue. Where do the particles come from? Can this be prevented? If so, how?

Unit V - Weather (Meteorology)

Concept A THERE ARE MANY FACTORS WHICH AFFECT WEATHER

Activities:

1. Use a weather vane to determine the direction of winds over a period of days and compare the results with a world wind directional map.
2. Observe the different kinds of clouds associated with fronts.
3. Identify the types of clouds by using a cloud chart.
    a. Cirrus - curly, white, high in the sky
    b. Stratus - low, thin and foglike
    c. Cumulus - piled-up, floating white masses about a mile above the land
    d. Nimbus - dark gray and rather formless, filled with rain.
4. Study a storm in phases. Have each child choose one phase to study and record. Possible phases might be:
    a. changes in clouds and formations
    b. action of rain above ground (in air, trees, on roofs)
    c. action of rain on the ground (splashing, flow, direction, various ground covers)
    d. behavior of trees
    e. behavior of people and animals in seeking shelter
    f. amount of thunder and lightning and their effects
    g. the length of the storm and changes in its intensity.

    Use the best descriptions to use in a booklet on the phases of a storm.

5. Observe the sun at a specific location during the different seasons. How might this change affect our weather? There are patterns in nature; even the motions of planets and stars have patterns.

6. Listen to television and radio reports to determine what kind of front is in the immediate area. Observe the weather associated with the report.

7. Measure changes in barometric pressure with a barometer over a period of days. Associate the change in weather with high and low pressure areas.

Concept B VARIOUS WEATHER INSTRUMENTS ARE USED TO FORECAST WEATHER

Activities:

1. Use home-built weather instruments to measure weather factors outside:

   a. Make a rain gauge by using a jar with the same width at the top and bottom to collect rain. Use a ruler to mark the scale on the jar.

   b. Make a wind vane by using a carefully balanced arrow made of light wood and placed on a pivot. (the head of a pin in a block of wood)

   c. Make an anemometer to measure wind speed by attaching paper hot cups to a circle of cardboard, or a pair of crossed sticks, then attach them to a pivot post.

   d. Measure humidity by using dry bulb and wet bulb thermometers. Then use a relative humidity chart to determine humidity.

   e. Compare readings of the home-made instruments with the readings from more scientific instruments.

Unit VI - Plants (Botany)

Concept A DIFFERENT PLANTS HAVE DIFFERENT PURPOSES

Activities:

1. On a walk, note which plants provide food for other organisms, and which provide shelter. Do some provide both? Do not forget insects, birds, mammals, rodents, other plants.
2. Look under bushes for the presence of animal or plant life. Discuss why they are, or are not, present.
3. Examine three samples of materials as steps in the formation of soil:
    a. Top - broken twigs and leaves
    b. Middle - material which is partly decayed
    c. Bottom - loam, browning decay.
4. Make a list of the plants used for food. Arrange to plant some at school to be transplanted as garden raised foods. (Tomatoes, corn, peas, beans) The same thing may be done with flowers.

Concept B PLANT CHARACTERISTICS ARE USED TO IDENTIFY DIFFERENT PLANTS

Activities:

1. Collect leaves from several different plants. Have children look for similarities and differences and record these in categories. (size, shape, edges, colors, texture, stem arrangement,

2. Keep a clue chart record of each different tree specie observed.

Shape	Leaves	Bark	Branching	Fruit	Flowers	Name
(General)	(shape)	(ridged,	(buds)	(ripe)	(color)	(location)
(Branches;	(simple or	smooth)	(shape)	(use)	(size)	(uses)
slender	compound)	(color)	(scars)	(date)	(date)	(relatives)
stocky,few	(edge,color)		(color)			

3. Have children label the trees with name, age, and something of interest about the species. Tagboard laminated with plastic in a thermofax machine, glued to a board or piece of masonite will work.
4. Have the children make a survey of the school yard to see how many kinds of trees they can find. Follow up with a map of the trees of the grounds.
5. In winter, attempt to identify the trees by over-all shape that can be seen more definitely while leaves are gone.
6. From the observations made in previous activities, set up a simple classification key which the students come up with in using the "discovery" method.

Unit VII - Ecology

Concept A ALL LIVING THINGS ARE DEPENDENT UPON THEIR ENVIRONMENT

Activities:

1. Several days before the lesson is to be introduced, display in the classroom two jars of water. Place a piece of a water plant in one jar, and a piece of a plant that normally grows in soil in the other. When a definite change is seen in the plant which normally grows in soil, call the attention of the group to the fact. What is the condition of the plant? Why? Discuss the concept that plants grow in specific conditions.
2. Take a field trip to observe plant communities. The trip could begin at school and extend to fields, woods, ponds, and marshy areas. Morton Arboretum has tours available. Compare plant communities in the various locations. Would animals in different habitats be different? Why?
3. As a continuation of Activity 2, bring back as least three plants found in water, three from the woods, and three from dry rocky hillside. Put one of each kind in soil, water, and leave out one of each. Discuss and seek explanation of the results.
4. Set up a balanced aquarium and two terrariums, one of

wood's soil, and one of dry, sandy soil. Allow students to care for it and make changes as they think best, but record the changes and the results.

5. Have children plant seeds (beans) in various soils (loam, sand, gravel). Also plant some seeds in a wet paper towel. Set some of each in darkness, and some in sunlight. Also put some in a hot place (furnace room, or on a radiator in winter) and some in a cold place (refrigerator or outdoors in winter). Record the various results and draw conclusions concerning the "best" growing conditions. Relate these conclusions to different plants. Do all plants require the same conditions as beans? Does this tell us why various crops are grown in different climates and seasons?
6. For those hunters and fishermen in your classroom, how does the hunter locate a place where his quarry will be likely to live? Consider factors such as food, shelter, water, climate, season, weather, time of day (or night). Have children study the habits and habitat of quarry which interest him and share this with others in the class by a report (orally, written), overhead transparencies, slides, pictures, display, tape recording or a variety. Have the child or children tell of the ways the quarry's environment is of importance. Outdoor magazines are of great help here.
7. If you can, locate a family of squirrels, time observa-

tions, probably early morning, to coincide with its most active hours. Watch to see how it uses its environment. What do the squirrels eat? Where do they live? What is the home made from? What benefits do squirrels have for man? What uses the squirrel as food? (See Illinois Mammals, State of Illinois, Springfield).

8. Take a field trip to McGraw Wildlife Preserve, or Morton Arboretum for guided tours to have class learn how all segments of nature are interdependent.
9. Bring in one of the resource people to speak to the class on food chains, and how many organisms are food for others. The balance of nature is important, because too many of one kind may harm the environment for use by others. Is man having a problem here?
10. Go to a pond, marsh or stream. Look for the different habitats and how they blend into each other. At the edge will be plants that need a lot of moisture (cattails, willows). There may be some surface plants and other plants beneath the surface. Discuss the reasons for their habitats. What do these various plants do? (Give off oxygen, provide food, build up the soil, hold the soil in place). Why might some fish and other animals live in and around water plants? (Food, shelter, safety). Can you see beauty here? With a little creative thought, you and your students might make a collage picture with things taken from near the water.

Also, incidentally, those fish under the lily pads must eat some time. Why not some child's fishing lure or bait?

11. Invite a resource person to talk with the class on ecology, or some particular ecological system (forest, field, ocean, marsh).

12. See Elgin Public Schools Intermediate Science Research Guide and Supplement, p. 40 - 42, Unit on Water Pollution.

Concept B A NATURE TRAIL CAN BE AN OUTDOOR LABORATORY TO LEARN ABOUT ECOLOGICAL INTERRELATIONSHIPS

Activities:

1. Learn about, plan, prepare for, and develop a nature trail.

    a. Before taking a field trip to a nature trail at a place like Morton Arboretum, or Crab Tree Lake Nature Center, discuss with your class, "What is a nature trail?"

    b. While on a nature trail field trip, note the layout, signs, name plates, bodies of water, land forms, soil, rocks, and evidences of interrelationships between plants, animals, and man. Follow up with an evaluation with the class, and discussion of the value of an outdoor laboratory. Lead your students to begin planning to make a nature trail.

    c. After the location of your nature trail, whether small or large, has been determined, the following steps might be considered.

        1) Area - clear a trail

        2) Establish the trail and mark - use stones, or posts, to mark edges. Do not leave bare ground subject to erosion.

3) Plant or transplant along trail as is necessary.

4) Have student groups study features of the trail; plants, animals, soil, rocks, land forms, streams other features.

5) Decide how others can use it best, and how to make signs and markers appropriate to its use.

6) Make a large sign for starting point.

7) After completing the trail and signs and explanations, plan the end of the trail to climax it with an interesting display or something of special interest.

8) Be sure good conservation measures have been employed as they apply to plants, animals, undergrowth, humus, hollow trees, dead trees, rocks, and brush.

9) The children will make the signs, guide sheets, brochures, pictures, illustrations, and descriptions of features of the nature trail.

10) Other related activities may be done in conjunction with either preparation or use of the nature trail. Weather station, outdoor classroom with seats, bird feeders, tree growth display, bridge, aquatic life display, or erosion control display.

11) The trail may be used by people other than your class and school. Invite others including parents and area conservation minded groups. Never consider it finished, but keep improving it.

Unit VIII - Forest Conservation

Concept A TREES PROVIDE FOR MANY OF OUR NEEDS

Activities:

1. Observe a freshly cut log or stump. Point out and mark the different layers of the tree (bark, cambium layer, lapwood, heartwood). Discuss the purposes of each layer. Protection, growth, food, water and mineral transportation, strength.
2. Study the main parts of a tree - roots, trunk, and crown, using the trees in or near the school.
3. Make a diorama depicting forest life and a tree as the center.
4. Visit a publishing company, or furniture store or lumber yard to see how wood products are used.

Concept B A FOREST IS A COMMUNITY OF PLANTS AND ANIMALS

Activities:

1. Visit a forest preserve, arboretum or a wooded area to observe animals and plants found there. Keep a list and share observations. Morton Arboretum has guided tours to aid the teacher and the class.
2. Choose one tree as a study station. Study closely plant life on or near it, (seedlings, lichen, moss, creepers, vines, flowers, plants) and animal life living on or near it (moths, caterpillars, ants,

birds, chipmunks, squirrels, beetles, insects and earthworms). Name other larger animals that may not be in evidence, but whose homes may be nearby (skunks, opposums, foxes, rabbits).

3. Spread a sample of the forest floor on white paper. Examine it for living organisms. Many will be microscopic, so prepare some slides to be shown later. Notice the humus.
4. Alphabet game - "I'm thinking of an animal or a plant I saw today that begins with the letter A, B, C, D . . . "

Concept C FORESTS BUILD AND HOLD SOIL

Activities:

1. Study seed dispersal. Find a large tree; notice seedlings of the same kind within the area. Chart your findings.
2. Go into a forest and notice leaf coverage on the ground. Dig to the bottom and notice differences between top and bottom layer. Note decaying plant materials and building up of the soil.

Concept D FORESTS HELP PROTECT WATER-SHEDS AND REGULATE STREAMFLOW

Activities:

1. After a hard rain observe the run-off from a steep hill covered with trees and the run-off from a cultivated field with a similar degree of slope. Check depth that the moisture penetrates on the two areas by dig-

ging a section from each area.

2. At a nature center look at the streams to note color and amount of sediment. Compare this with the Fox River or a stream running through cultivated fields.

Concept E FORESTS HAVE MANY ENEMIES: INSECTS, DISEASES, FIRES, ANIMALS AND MAN

Activities:

1. Collect specimens of diseased or insect damaged twigs and leaves. Study to determine the cause and what can be done or is being done to prevent this. Ask a conservation employee to talk to your class on forestry.
2. Consult a local historian to find out if forests once covered this area.

Concept F TREES ARE A CROP THAT SHOULD BE MANAGED

Activities:

1. Take a field trip to locate and observe a tree that has reached full maturity and is beginning to deteriorate or has deteriorated. Notice decay. Notice effect on surrounding trees.
2. Visit a tree nursery to see how the trees are planted and treated to insure quality trees.
3. Visit a place like Morton Arboretum where trees have been planted.

Unit I - Maps and Map Making

Concept A MAPS CAN BE USED TO STUDY OUTDOOR FEATURES

Activities:

1. Have pupils make a map of the school grounds or some area of it. Use this first draft to reteach map reading and map making skills. Were directions clearly and correctly shown? Is the map drawn to scale? Are main features shown? Discuss the results with the children and look for need for skill improvement.
2. On a pupil-made map have them place the regions of the school grounds only. They might color each region of grass one color and other regions like bare soil, cement or asphalt in other colors. This type of map may be compared to a map of a large area showing land use, or surface type.
3. A map of the neighborhood or town may be made using yarn for streets. Use the compass to help the class locate proper directions.
4. As the students study the various countries and continents of the world, they might compare their land features from globe and map with those of our own country, state and area.

Unit II - People and Their Environment

Concept A PEOPLE ARE INFLUENCED BY THEIR ENVIRONMENT

Activities:

1. In discussion with your class consider some of the following questions:

   a. How did the local climate affect your dress today?

   b. Why is your region a suburban or rural area?

   c. What are the main products made or raised in this area?

   d. What are the main occupations in this area? Why? What occupations are not found here?

   e. How do the main products and occupations affect the lives and activities of the people around here?

   f. What is one region of the United States (or the world) that you consider to be greatly different in natural environment from your own area? How does the way of life there differ from your own? Why?

   g. What natural advantages may have drawn the first settlers to this area?

   h. Are these natural advantages still available? How might they have changed?

   i. What might have been the reasons for the selection of your school site?

   j. How have other people affected you today? Have you affected others today? In what ways?

   k. Have you done something special to benefit your environment today?

Unit I - Written Expression

Concept A THE OUTDOORS STIMULATES CREATIVE EXPRESSION

Activities:

1. Take class outdoors. Express reactions to the natural environment by writing Haiku poetry.
2. Select a small area of grass and observe the insect life. Imagine how it would feel to be an insect. Write short stories of events in the life of insects.
3. Direct pupils: "Observe and art colony and then pretend that you are an ant in the colony. Describe the life in the colony".
4. Describe interesting sounds, formations, and colors, using·
   (a) one word, (b) a phrase, (c) one sentence descriptions.
5. Compose poems related to outdoor experiences.
6. Write a story about an object seen through a hand lens.

Concept B NOTE-TAKING IS USEFUL IN DISCOVERING THE OUTDOORS

Activities:

1. Take notes during an outdoor observation period. Follow up with a discussion period and compare notes.
2. Select a plant to describe. Take notes; then write a descriptive paragraph from the notes.
3. Find a nature specimen of some living or dead thing in the woods or field, and check it out in a resource book,

using field notes taken by pupils

4. Put headings on five small sheets of paper - one for each of the five senses - allow time during an outdoor experience to jot down the learnings gained from each method of observation. Will any of your students be writers or use their writing talents through life? You may be the spark to ignite their fire in writing.

Unit II - Oral Expression

Concept A OUTDOOR EXPERIENCES PROVIDE OPPORTUNITY AND MOTIVATION FOR ORAL EXPRESSION

Activities:

1. Act out parts that show outdoor characters. Animals, birds, fish.
2. Go to a wooded area and imagine what might have happened there one hundred years ago. Create a story by letting one person begin telling the story, stopping him and letting another person continue.
3. Take a walk in a wooded area. On return to the classroom, describe orally what impressed you the most.
4. Visit a creek or a river and tell tall tales about the formation of these streams.
5. Have a speech contest to motivate children to express feelings about conservation, pollution, outdoor beauty or any topic related to an outdoor experience.

Unit III - Vocabulary

Concept A OUTDOOR EXPERIENCES CAN HELP IN VOCABULARY DEVELOPMENT

Activities:

1. Keep charts of new words found in outdoor activities.
2. Have a spelling bee, or play spelling baseball using new words from outdoor activities.
3. Have children imagine new words that they have never heard, and give them their own meaning.
4. Make lists of soft words, hard words, tall words, dark words, scarry words, flat words, beautiful words, bright words, rough words, dim words. Have the children write a happy story with happy words, or a thick story from thick words. Only a stretch of the imagination away will be found endless varieties of new experiences.

Unit I - Measurement

Concept A ESTIMATING IS A WAY OF MEASURING

Activities:

1. Estimate the height of a tree using the child's own height for comparison.
2. Estimate the area of the room, tennis court, baseball diamond or another court and compare with accurate measurement.
3. Estimate the width of a stream or river.
4. Estimate the height of the school building.
5. Estimate the time of day by using the position of the sun. Noon finds the sun about on the north south line overhead. Draw a circle arourd a tree at 9:00 a.m. as large as the tip of its shadow and label and circle, on the ground, the time. Continue for each hour of school day.
6. Estimate the temperature by listening to a cricket chirp for fifteen seconds, counting the chirps, and adding forty. Test it by using a thermometer.
7. Estimate the difference between two points by using sound. (Sound travels at the rate of about 1100 feet per second under normal conditions of temperature and pressure.)
8. Make a sundial.

Concept B MEASUREMENT IS EVERYWHERE

Activities:

1. Measure the perimeter of the school grounds; other areas within that perimeter.
2. Measure the circumference and diameter of a tree. Use the formula pi D to show pi as 3.14. The tree should be nearly round.
3. Go outside to look for things with various angles such as acute, obtuse, or right angles.
4. Make personal measurements such as length of reach, pace, nose, length of outstretched hand, height.
5. Use a compass to walk the perimeter of an equilateral triangle and try to end up at the starting point.
6. Use an astrolabe or climometer to measure the angle of a slope.
7. Measure the age of a tree by the ring count. Think back to events that happened during the life of the tree.
8. Make a scale map of the school grounds.

Unit II - Charts and Graphs

Concept A GRAPHING AND CHARTING ARE USEFUL METHODS OF RECORDING

Activities:

1. Chart changing of tree shadow in relation to the time of day.
2. Use twine and stakes to lay out geometric figures. Measure these and plot them.
3. Plot readings of temperature of barometric pressure for a week.
4. Graph the number of children using various playground equipment or spaces in a given length of time - such as a day or a week.

Unit III - Rate, Ratio

Concept A COMPARISONS CAN BE MADE BY USING RATE AND RATIO

Activities:

1. Figure the height of a tree by using the ratio of its shadow to the shadow of a stake of known height.
2. Average the temperature readings for a period of time.
3. Count the number of trees in a specified area. For each kind of tree, figure the fractional part of the total number.
4. Invite a local bank employee to come to your class to discuss interest.

Unit I - Art

Concept A NATURE IS A STOREHOUSE OF ART

Activities:

1. Make a charcoal sketch using wood charcoal from a fire.
2. Find designs in nature such as lines, circles, squares, angles. Draw these designs. Use a woodburning set to make these designs on a piece of pine.
3. Observe the different shades of color in nature during the Fall or Spring and use these colors to draw abstract pictures, or nonrepresentations with color.
4. Collect plants, bar, roots, seeds, and clay to make natural paints and dyes. Use them.
5. Collect grasses, weeds, seeds, and pods to create nature pictures.
6. Gather seeds to make jewelry.
7. Gather natural materials such as leaves, flowers, and pebbles to embed in liquid plastic for key chains and paper weights.
8. Use grasses, vines and other vegetation to weave mats.
9. Gather natural materials to make mobiles.

Unit I - Music

Concept A MUSIC IS FOUND IN NATURE

Activities:

1. Use nature-made objects like gourds, stones, seed pods, acorns and caps, sticks, rocks, branches with dry leaves, hollow reeds, dried grass to make a rhythm band.
2. Experiment with the nature-made instruments to discover many different ways to use them to keep rhythm.
3. Can your students adapt hollow reeds or pieces of tree branches to make whistles or flute-like instruments? Try your own imagination to discover many applications for this idea and others.
4. Use your orchestra of rhythm instruments to play songs familiar to your class. Singing songs about nature, trees, birds or weather may be fun for your children.
5. Listen outside, to the sounds made by nature. The birds, trees, squirrels, and insects are some that make nature's music. Try to interpret the meanings of the sounds of animals and birds.
6. While listening to birds (early morning) notice differences not only in different birds' sounds, but also in tone and volume. You might want to take a cassette recorder along so the children may listen many times

to carefully compare the sounds.

7. Have your group sing in the out-of-doors. Beginning with lively songs and continuing tc more quiet songs.
8. Children may enjoy being motivated to write their own songs while quietly observing something they wish to write about. Topics like rivers, wind, clouds, rain, grass, green, blue, birds, love, nature, animals, bugs possibly could be used.

Unit I - Outdoor Safety

Concept A SAFETY, PRACTICED, HELPS ONE TO ENJOY THE OUTDOORS

Activities:

1. Identify poison ivy so all recognize it.
2. Demonstrate safe ways to carry and use tools such as knives, saws, axes, carving tools.
3. Discuss how to make camp fires. Place easily burned material on fireplace in a loosely wadded ball; lay many small twigs on this, followed by larger, then larger twigs and pieces of wood or logs. Finally, light the piece of wadded material from the upwind side with a match or other lighter. Do not stand immediately downwind from the fire. Sparks may fly with the breeze, and the smoke will give odor to the clothing. Practice this outside. The talent may be used when your class visits a nearby park or preserve, during mealtime, for any outdoor experience.
4. Survey the school grounds for hazzards.
5. Learn first aid measures. Personnel from the Red Cross or the school nurse might help you with this type of lesson.
6. Identify poisonous snakes, spiders, and insects.
7. Invite a law enforcement officer to discuss highway

safety, or conservation laws. Again be reminded, your own imagination is a valuable resource to bring learning experiences to your children.

Unit II - Disease Carriers

Concept A DISEASE-CARRYING INSECTS NEED TO BE CONTROLLED

Activities:

1. Search the school grounds for breeding places of flies and mosquitoes. Have children do some research to determine how these may be controlled. (Destroy the breeding place, use birds that eat insects, place praying mantis in the area).
2. Have someone from the local health department come to the class to explain how insects are controlled and why. Also a local pest control service may visit your class to demonstrate how to prevent pest harm.

Unit III - Water

Concept A ALL WATER IN THE GROUND IS NOT SAFE FOR DRINKING

Activities:

1. Collect water samples from various sources such as a deep well, spring, shallow well, river, pond, and puddle. Examine each through a microscope and compare. Note differences in odors of the samples.

Concept B MOST WATER CAN BE MADE SAFE

Activities:

1. Visit a sewage disposal plant on a school grounds, or the city disposal plant.
2. Visit the city pumping station to learn what processes the water goes through to be safe.
3. Purify some water by using chlorine tablets.
4. Boil water to kill germs. Shake it to put air back into it, otherwise it tastes flat.
5. The State Department of Health will have materials for the study of water use.

Unit IV - Physical Education

Concept A NATURE ORIENTED GAMES HELP US BECOME PHYSICALLY FIT

Activities:

1. Play Tree Tag. One or more persons are "It". Players are safe only when they are touching a designated tree. The persons who are "It" may change the tree that is safe.
2. Have each member of the class cut and decorate his own stick. Sticks should be about 1" thick and 4½" - 5" long. Have the players line up at a starting line, sticks at their feet. At a signal, each tries to get to a finish line first by kicking his stick.
3. A compass bearing is taken and followed to the destination desired. Objects in the path must be climbed over or under or pushed through.
4. Divide the group into teams. In a limited time, see which group can locate the most bird's nests in a certain length of time. Do not disturb the nests.
5. Divide the class into groups and give each group a particular object to find outdoors. After a group has found the object, assign another object to be found. The group finding the most objects wins the game.

6. Divide the class into groups and give each group a map to be followed to a designated point. The first group to reach the designated point wins. Certain nature objects may be picked up along the way. Also, instead of a map, a series of written directions may be used, or a series of clues, paces, or yards at each step along a compass route.

TEACHERS' RESOURCE

BIBLIOGRAPHY

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RESOURCE PLACES

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RESOURCE PEOPLE

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MAPS OF ELGIN PARKS

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Jones, Orville E., and Swan, Malcolm P.
Discovering Your Environment, Interstate Printers and Pub., Inc.

Charles E. Merril Books, "How and Why Wonder Books", Columbus: Charles E. Merril Books, Inc.

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Teaching Trips and Tips, Aurora: Aurora Public Schools West Side, District 129.

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VanDer Smissen, Betty, and Goering, Oswald H.
Nature Oriented Activities, Ames, Iowa: Iowa State University.

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ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Ahlstrand Park

Address:
W. side of Catalpa at Walnut, Hanover Park

Contact:
Jack Norman

Telephone:
837-2468

Advance Reservation:
No

Hours Permitted:
All daylight hours

Length of Tour:
- - - -

Time of Year:
All year

Day of Week Preferred:
All days

Guide Service Provided:
No

May teacher be guide?:
Yes

Size of Groups:
- - - -

Admission Fee:
No

Comments:

Parking Area Available:
Yes

Lunch Facilities:
No

Washroom Facilities:
Yes

Safety Precautions:
Marsh area (boots)

Process, Activity or Service to be Observed:
Marsh life - plants and animal life - seasonal and weather changes and their effects

Materials Available:
5 acres of high ground - pool & field house - baseball diamond - marsh on north side

Organization personnel available for school visits for pre-planning or follow-up?:
No

GRADE LEVEL

Primary Yes

Intermediate Yes

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page 212 blank

ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Bartlett Park

Address:
Between Oak & Eastern Ave.
on North Ave., Bartlett

Contact:
Clifford Iverson

Telephone:
837-6568

Advance Reservation:
No

Hours Permitted:
Dawn - dark

Length of Tour:
- - - -

Time of Year:
All year

Day of Week Preferred:
All days

Guide Service Provided:
No

May teacher be guide?:
Yes

Size of Groups:
- - - -

Admission Fee:
No

Parking Area Available:
Yes

Lunch Facilities:
Yes

Washroom Facilities:
No

Safety Precautions:
Normal

Process, Activity or Service to be Observed:
Trees, recreation area, squirrels, birds, insects

Materials Available:
No

Organization personnel available for school visits for pre-planning or follow-up?:
No

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:
Other Bartlett parks are available. Contact Mr. Iverson.

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ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Camp Big Timber

Address:
Big Timber Road, Elgin

Contact:
Mr. Barrick

Telephone:
896-9764

Advance Reservation:
Yes

Hours Permitted:
Anytime

Length of Tour:
No limit

Time of Year:
Any

Day of Week Preferred:
Any

Guide Service Provided:
Yes

May teacher be guide?:
Yes

Size of Groups:
No

Admission Fee:
No

Parking Area Available:
Yes

Lunch Facilities:
Sack lunch, tables, etc.

Washroom Facilities.
Yes

Safety Precautions:

Process, Activity or Service to be Observed:
Limited only by teacher's experience. (Would suggest a pre-tour visit by teachers.)

Materials Available:

Organization personnel available for school visits for pre-planning or follow-up?:
Yes William Ormond - 695-7334

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:

Mr. Stevens, Ranger - 742-2981 (tour for teacher before hand.

ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Crabtree Lake Nature Center

Address:
R.R. #1 Box 334, Stover Rd.
Barrington, Ill. 60010

Contact:
Cook County Conser. Dept.

Telephone:
CO1-8400

Advance Reservation:
Yes

Hours Permitted:
9:00 - 4:30

Length of Tour:
Introductory talk only

Time of Year:
All year

Day of Week Preferred:
All days

Guide Service Provided:
No

May teacher be guide?:
Yes

Size of Groups:
- - - -

Admission Fee:
No

Parking Area Available:
Yes

Lunch Facilities:
Yes

Washroom Facilities:
Yes

Safety Precautions:
None

Process, Activity or Service to be Observed:
Nature Center with self-guided trails - displays

Materials Available:

Organization personnel available for school visits for pre-planning or follow-up?:

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:
Pre-tour is suggested.
Conservation work shops are conducted by Mr. Charles Westcott - call 381-6592.

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ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Elgin Sanitary District

Address:
Raymond Street Road
Elgin, Illinois

Contact:
Mr. Giles McVey

Telephone:
742-2068

Advance Reservation:
Yes - 1 week

Hours Permitted:
8:00 AM to 4:00 PM

Length of Tour:
1 hour

Time of Year:
Fall and spring

Day of Week Preferred:
Mon. thru Fri.

Guide Service Provided:
Yes

May teacher be guide?:
May assist

Size of Groups:
10 - 30

Admission Fee:
None

Parking Area Available:
Yes

Lunch Facilities:
No

Washroom Facilities:
Yes

Safety Precautions:
No running

Process, Activity or Service to be Observed:
Raw sewage, treatment process, removal of solids, purifying water for return to river.

Materials Available:
Booklet

Organization personnel available for school visits for pre-planning or follow-up?:
Yes

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:
Avoid tour in January and February (ice and snow).

ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Hills Nursery

Address:
Highway 72 - 31
D

Contact:
Gay Laubsch

Telephone:
426-3451

Advance Reservation:
Yes

Hours Permitted:
8:00 - 5:00

Length of Tour:
1/2 hour

Time of Year:
Anytime except April & May

Day of Week Preferred:
Any

Guide Service Provided:
Yes

May teacher be guide?:
Yes

Size of Groups:
Any size

Admission Fee:
No

Parking Area Available:
Yes

Lunch Facilities:
No

Washroom Facilities:
Yes

Safety Precautions:
Yes

Process, Activity or Service to be Observed:
Horticulture

Materials Available:
None

Organization personnel available for school visits for pre-planning or follow-up?:
Yes

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:
Teacher may be guide if she is knowledgeable.

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ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Kane County Forest Preserve

Address:
P.O. Box 215, So. Batavia Ave.
Geneva, Illinois 60134

Contact:
Gunnar Anderson

Telephone:
232-2631

Advance Reservation:
No

Hours Permitted:
7 AM - 10 PM

Length of Tour:
- - - -

Time of Year:
All year

Day of Week Preferred:
All days

Guide Service Provided:
No

May teacher be guide?:
Yes

Size of Groups:
- - - -

Admission Fee:
No

Parking Area Available:
Yes

Lunch Facilities:
Yes

Washroom Facilities:
Yes

Safety Precautions:
- - -

Process, Activity or Service to be Observed:

Materials Available:
Map showing locations and giving descriptions of Kane County Forest Preserves.

Organization personnel available for school visits for pre-planning or follow-up?:

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:
There are three undeveloped, and two developed forest preserves near U-46. Contact Mr. Anderson, Superintendent, for information on these and others in Kane County.

ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Materials from Lake County Soil and Water Conservation District

Address:
P.O. Box 555
Lake Zurich, Ill.

Contact:
Lee Bridgman

Telephone:
438-6319

Advance Reservation:

Hours Permitted:

Length of Tour:

Time of Year:

Day of Week Preferred:

Guide Service Provided:

May teacher be guide?:

Size of Groups:

Admission Fee:

Comments:

Parking Area Available:

Lunch Facilities:

Washroom Facilities:

Safety Precautions:

Process, Activity or Service to be Observed:

Materials Available:
1. Sharing Our Land with Wildlife
2. Washout
3. To Save Our Land
4. Resource Planning and Development
5. America the Beautiful

Organization personnel available for school visits for pre-planning or follow-up?:

GRADE LEVEL

Primary Yes

Intermediate Yes

Filmstrips:
1. Our Soil
2. Our Water and Air
3. Our Forests
4. Our Grasslands
5. Our Minerals and Energy Resources
6. Some Problems We Face

For the above materials you may borrow the slide sets and filmstrips and order thr free portfolio of pamphlets. Give them the first and second date choices.

ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Lord's Park Museum & Children's Farm Zoo

Address:
Northeast Side of Elgin

Contact:
Parks & Recreation Dept.

Telephone:
695-6500, Ext. 237

Advance Reservation:
no

Hours Permitted:
Dawn - dark

Length of Tour:
- - - -

Time of Year:
All year

Day of Week Preferred:
All day

Guide Service Provided:
No

May teacher be guide?:
Yes

Size of Groups:
- - - -

Admission Fee:
No

Parking Area Available:
Yes

Lunch Facilities:
Yes - reservations for Pavilion

Washroom Facilities:
Yes

Safety Precautions:
Normal

Process, Activity or Service to be Observed:
Lowlands, nature trails, museum of Natural History, stone collection, petrified rock, farm zoo, chestnut & maple trees, ponds and streams

Materials Available:
No

Organization personnel available for school visits for pre-planning or follow-up?:
No

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:

Children should also be encouraged to use this facility with their families.

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ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Max McGraw Wildlife Foundation

Address:
P.O. Box 194
Dundee, Ill. 60118

Contact:
Dr. George Barger

Telephone:
741-8000

Advance Reservation:
Yes

Hours Permitted:
10:00 AM - 4:00 PM

Length of Tour:
45 min. - 1 hr.

Time of Year:
Best time March through June

Day of Week Preferred:
Tues., Wed., Fri.

Guide Service Provided:
Yes

May teacher be guide?:
No

Size of Groups:
40/group

Admission Fee:
None

Parking Area Available:
Yes

Lunch Facilities:
No

Washroom Facilities:
No

Safety Precautions:
Discussed by guide

Process, Activity or Service to be Observed:
Hatching and rearing of water fowl and upland game birds.
Fishing research

Materials Available:
Mimeograph sheets on history, management, and research being carried on.

Organization personnel available for school visits for pre-planning or follow-up?:
Yes

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:
McGraw is a "modern Game Farm", with over 40 acres of rearing pens, produces nearly 100,000 mallards, pheasants, wild trukeys and other game birds annually for a wide range of research and management projects. Thirty ponds and small lakes, including 14 one-acre ponds, provide a variety of conditions for fisheries research.

A fair quantity of hatching eggs are available for incubator purposes.

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ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Morgan's Flowers, Inc.

Address:
975 South State St.
Elgin, Ill. 60120

Contact:
Mr. Sevick

Telephone:
74-1080

Advance Reservation:
Yes - 1 week

Hours Permitted:

Length of Tour:
Determined by interest

Time of Year:
All year

Day of Week Preferred:
Mon. thru Fri.

Guide Service Provided:
Yes

May teacher be guide?:
No

Size of Groups:
30

Admission Fee:
No

Parking Area Available:
Yes

Lunch Facilities:
No

Washroom Facilities:
No

Safety Precautions:
No

Process, Activity or Service to be Observed:
Greenhouse operation and flower arranging

Materials Available:
No

Organization personnel available for school visits for pre-planning or follow-up?:
No

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:
Do not plan visits the week of holidays.

ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Old Graue Mill

Address:
1/2 mile North of the intersection of York Rd. and Rt. 34 (Ogden Ave.) Hinsdale, Ill.

Contact:
Wendall Jackson

Telephone:
323-0878
After May 1, call 654-9703

Advance Reservation:
Yes

Hours Permitted:
11:00 AM to 6:00 PM

Length of Tour:

Time of Year:
May to Mid-October

Day of Week Preferred:
Mon, through Fri.

Guide Service Provided:
Miller available

May teacher be guide?:
Yes

Size of Groups:
Classroom size

Admission Fee:
None

Parking Area Available:
Yes

Lunch Facilities:
Forest Preserve facilities

Washroom Facilities:
yes

Safety Precautions:
Typical care

Process, Activity or Service to be Observed:
Only remaining water mill in the area.

Materials Available:
Pamphlet

Organization personnel available for school visits for pre-planning or follow-up?:
No

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:
Mill machinery and stone grinding of corn, farm and home implements, small collection of firearms of civil war period, early toys, exhibit of old country store, Victorian parlor and bedroom, early kitchen and living room.

Forect preserve could also be visited at this time.

ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Premier Flower Shop

Address:
245 Dundee Ave.
Elgin, Ill. 60120

Contact:
Mr. LeRoy Huxtable

Telephone:
741-0117

Advance Reservation:
Yes - 1 day

Hours Permitted:
9:00 - 6:00

Length of Tour:
30 min.

Time of Year:
Any time (not holidays)

Day of Week Preferred:
Mon through Thurs.

Guide Service Provided:
Yes

May teacher be guide?:
Yes

Size of Groups:
Up to 30

Admission Fee:
None

Parking Area Available:
Yes

Lunch Facilities:
None

Washroom Facilities:
Yes

Safety Precautions:
- - - -

Process, Activity or Service to be Observed:
Observation in greenhouse: refrigerator, the kinds of flowers and plants from different parts of the world.

Materials Available:

Organization personnel available for school visits for pre-planning or follow-up?:
No

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:
Sometimes there is an unexpected rush on Mr. Huxtables services and it may become necessary to cancel reservations. Also, there are many breakables - do not touch.

ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Randall Oaks Park & Zoo

Address:
Randall Rd. 1/2 mile North of Route 72

Contact:
Dundee Township Park District
2 Pine St., Carpendersville, Ill.

Telephone:
428-3621

Advance Reservation:
1 month

Hours Permitted:
10 AM until dark

Length of Tour:
1/2 hour

Time of Year:
May 1 to Oct. 1

Day of Week Preferred:
Mon. through Fri.

Guide Service Provided:
No

May teacher be guide?:
Yes

Size of Groups:
75 - with adequate supervision

Admission Fee:
10¢ - children
25¢ - adults

Parking Area Available:
Yes

Lunch Facilities:
Yes - picnic facilities - tables, grills & pop machine

Washroom Facilities:
Yes

Safety Precautions:
Keep hands off cages & stables

Process, Activity or Service to be Observed:
Pony rides, feeding animals and a close-up look which is a "first" for some children.

Materials Available:
- - - -

Organization personnel available for school visits for pre-planning or follow-up?:
No

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:
Small animals (domestic & wild) are available to be seen close up in the barn.

If popcorn & peanuts are brought, they may be fed to the animals.

There are facilities for tetherball, grounds for kickball and equipment including swings, slide, etc.

ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Streamwood Park Districk

Address:
777 Bartlett Rd.
Streamwood, Ill.

Contact:
Dahlvin Peterson

Telephone:
289-3003

Advance Reservation:
No; except for fieldhouse

Hours Permitted:
7 - 10:30

Length of Tour:
- - - -

Time of Year:
All year

Day of Week Preferred:
All days

Guide Service Provided:
Mr. Peterson upon request

May teacher be guide?:
Yes

Size of Groups:
- - - -

Admission Fee:
No

Parking Area Available:
On streets only

Lunch Facilities:
At Shady Oaks Park Field House

Washroom Facilities:

Safety Precautions:
Wet areas

Process, Activity or Service to be Observed:
Plants and animals, wetlands, marshes, insects, recreational use of land

Materials Available:

Organization personnel available for school visits for pre-planning or follow-up?:
Dahlvin Peterson, Park Management Outdoor Recreation & Education

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:
Various small park areas are available. Call Mr. Peterson to get specific information.

ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Trout Park & Botanical Gardens

Address:
Northeast side of Elgin near Tollway on Rt. 25 or Dundee Ave.

Contact:
Parks & Recreation Dept. City Hall, Elgin

Telephone:
695-6500, ext. 237

Advance Reservation:
No

Hours Permitted:
Dawn - dark

Length of Tour:
- - - -

Time of Year:
All year

Day of Week Preferred:
All days

Guide Service Provided:
Part-time

May teacher be guide?:
Yes

Size of Groups:
- - - -

Admission Fee:
No

Parking Area Available:
Yes

Lunch Facilities:
Yes - shelter

Washroom Facilities:
Yes

Safety Precautions:
Footing is not always good

Process, Activity or Service to be Observed:
White cedars, northern climate plants, glacial influence, alkaline soil, tufa result of limestone underlay, birds, animals, walnut grove. Path system through Botanical Garden

Materials Available:
Folder on gardens

Organization personnel available for school visits for pre-planning or follow-up?:
No

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:
Approximately 40 acres, of which 26 acres are natural woodlands, stream and meadow.

ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Wayne DuPage Forest Preserve

Address:
South Bartlett Road
Bartlett, Ill.

Contact:
DuPage Forest Preserve District

Telephone:
629-5700

Advance Reservation:
No

Hours Permitted:
9:00 - 4:30

Length of Tour:
- - - -

Time of Year:
All year

Day of Week Preferred:
All days

Guide Service Provided:
No

May teacher be guide?:
Yes

Size of Groups:
- - - -

Admission Fee:
No

Parking Area Available:
No

Lunch Facilities:
No

Washroom Facilities:
No

Safety Precautions:
Walking along So. Bartlett Rd.

Process, Activity or Service to be Observed:
Woodland with pond and wet areas. Old oak trees in natural setting. Animals, including deer, squirrels and birds.

Materials Available:

Organization personnel available for school visits for pre-planning or follow-up?:
Yes

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:

Mr. Iverson, phone 837-6568, Bartlett Park Director, is directing the use of this forest preserve.

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ELGIN AREA OUTDOOR EDUCATION RESOURCES

Name of Resource:
Wing Park

Address:
Northwest side of Elgin on Wing Park Boulevard

Contact:
Parks & Recreation Dept.
City of Elgin

Telephone:
695-6500, ext. 238

Advance Reservation:
No

Hours Permitted:
Dawn - dark

Length of Tour:
- - - -

Time of Year:
All year

Day of Week Preferred:
All days

Guide Service Provided:
No

May teacher be guide?:
Yes

Size of Groups:
- - - -

Admission Fee:
No

Parking Area Available:
Yes

Lunch Facilities:
Yes

Washroom Facilities:
Yes

Safety Precautions:
No

Process, Activity or Service to be Observed:
Plant and animal life - Hawthorne, crab apple trees scattered. Recreational use of land.

Materials Available:

Organization personnel available for school visits for pre-planning or follow-up?:
Pre-visit by teacher is recommended

GRADE LEVEL

Primary Yes

Intermediate Yes

Comments:
Band shell available as stage for outdoor classes.

ELGIN AREA OUTDOOR EDUCATION RESOURCE PEOPLE

Subject: Home Economics, 4-H, planting and insect control

Name: Philip Ferris

Address: Kane County Cooperative Extension Service
P.O. Box 589
St. Charles 60174

Telephone: 584-6166

Come to School for Presentation? Yes

Presentation at Their Home? No

Equipment Needed for Presentation? None

Is there a fee? No

Note: Mr. Ferris is the adviser in Agriculture.

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ELGIN AREA OUTDOOR EDUCATION RESOURCE PEOPLE

Subject: Marine Ecology - containing oil spills in water

Name: John D. Harper

Address: Box 83, Rt. 1
Elgin, Illinois 60120

Telephone: 741-9053

Come to School for Presentation? Yes

Presentation at Their Home? No

Equipment Needed for Presentation? Will be provided by Mr. Harper.

Is there a fee? No

Note: Mr. Harper is a director of E.P.R.O. (Environmental Parameters Research Organization) which is involved nationwide in marine ecology research, especially as man's influence is detrimental in specific areas, like the proposed Lake Michigan Airport.

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ELGIN AREA OUTDOOR EDUCATION RESOURCE PEOPLE

Subject: Math applied outdoors

Name: Jack Hotsenpiller

Address: 4 So. Gifford
Elgin, Illinois 60120

Telephone: 741-6800, ext. 320

Come to School for Presentation? Yes

Presentation at Their Home? No

Equipment Needed for Presentation? Arrange with Mr. Hotsenpiller

Is there a fee? No

Note: Mr. Hotsenpiller welcomes requests by teachers to use his math ability for their classes.

ELGIN AREA OUTDOOR EDUCATION RESOURCE PEOPLE

Subject: Soil and Water Conservation

Name: Kane County U.S. Soil Conservationist (new person soon)

Address: 720 E. State St.
Geneva, Illinois

Telephone: 232-0820

Come to School for Presentation? Yes

Presentation at Their Home? No

Equipment Needed for Presentation? None

Is there a fee? No

Note: The conservationists work mainly with small property owners and governmental units on problems dealing with soil and water.

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ELGIN AREA OUTDOOR EDUCATION RESOURCE PEOPLE

Subject: General Science

Name: Larry Nemmers

Address: 764 W. Chicago St.
Elgin, Ill. 60120

Telephone: 742-3389

Come to School for Presentation? Yes

Presentation at Their Home? No

Equipment Needed for Presentation? Call for arrangements

Is there a fee? No

Note: Mr. Nemmers welcomes requests by teachers to use his science ability for their classes.

ELGIN AREA OUTDOOR EDUCATION RESOURCE PEOPLE

Subject: Park Management, Outdoor Recreation & Education

Name: Dahlvin Peterson

Address: 777 Bartlett Rd.
Streamwood, Ill.

Telephone: 289-3003

Come to School for Presentation? Yes

Presentation at Their Home? No

Equipment Needed for Presentation? Arrange

Is there a fee? No

Note: Mr. Dahlvin Peterson is Park Director for Streamwood Park District, and has background in many areas related to Outdoor Education.

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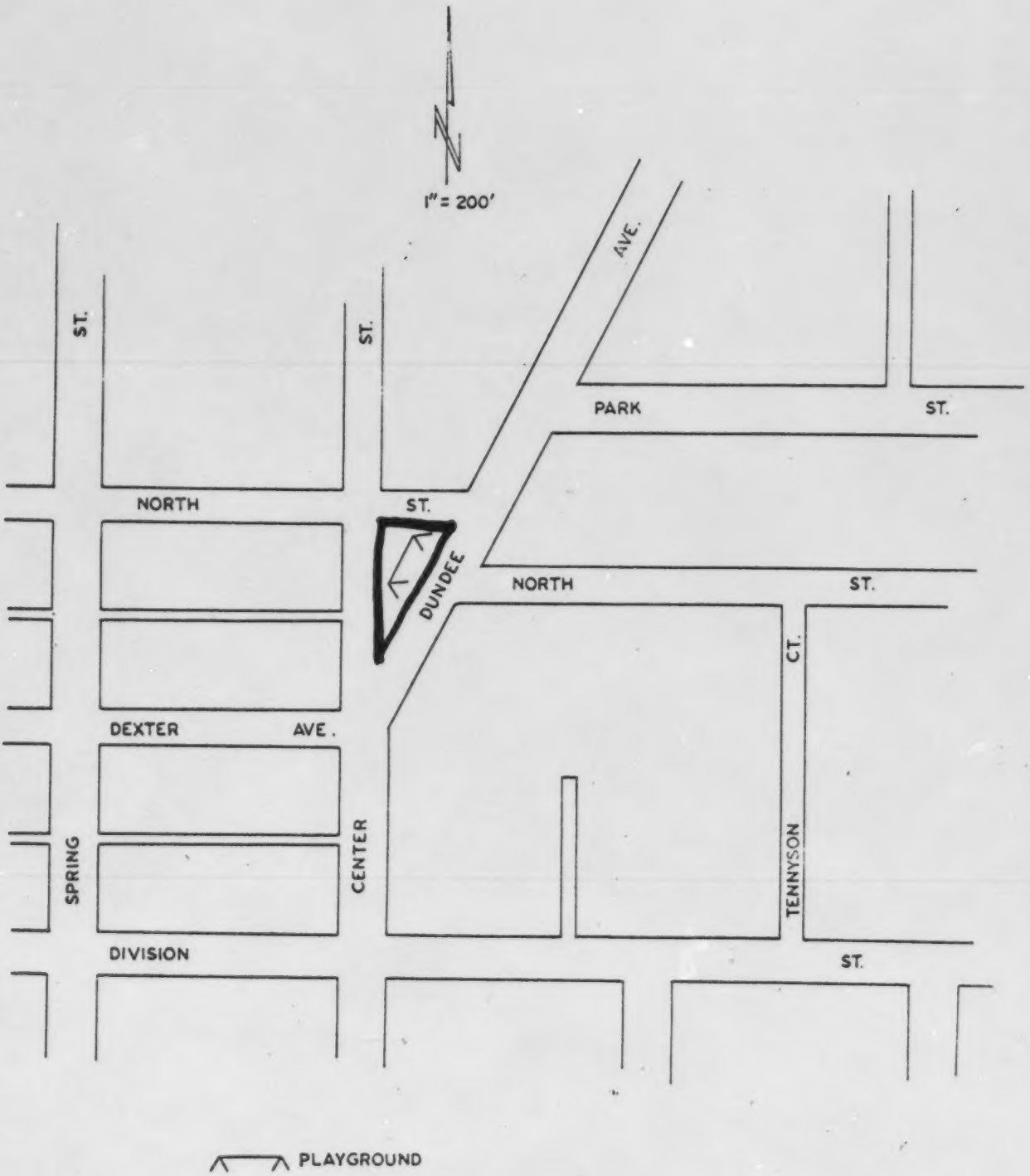
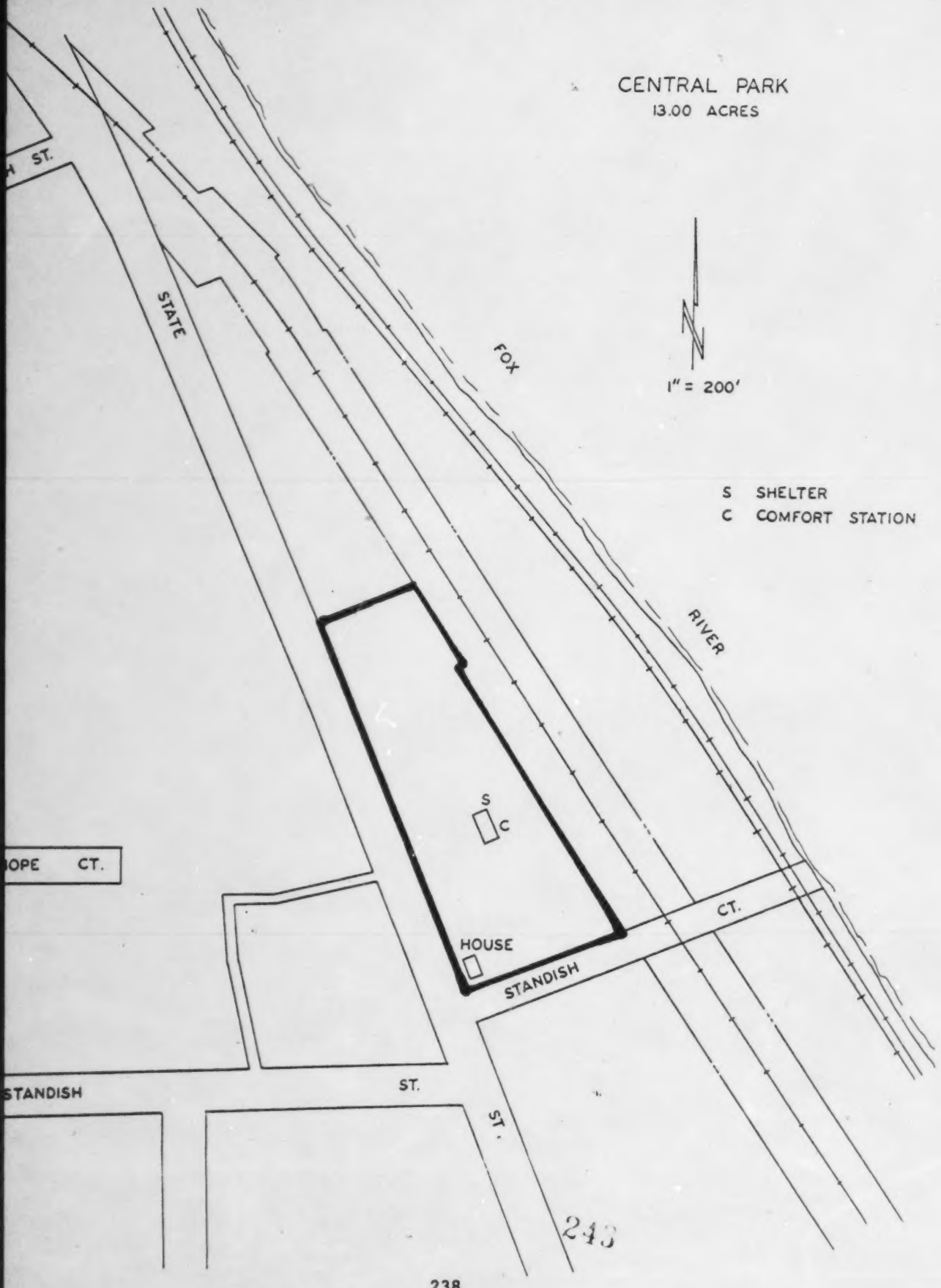
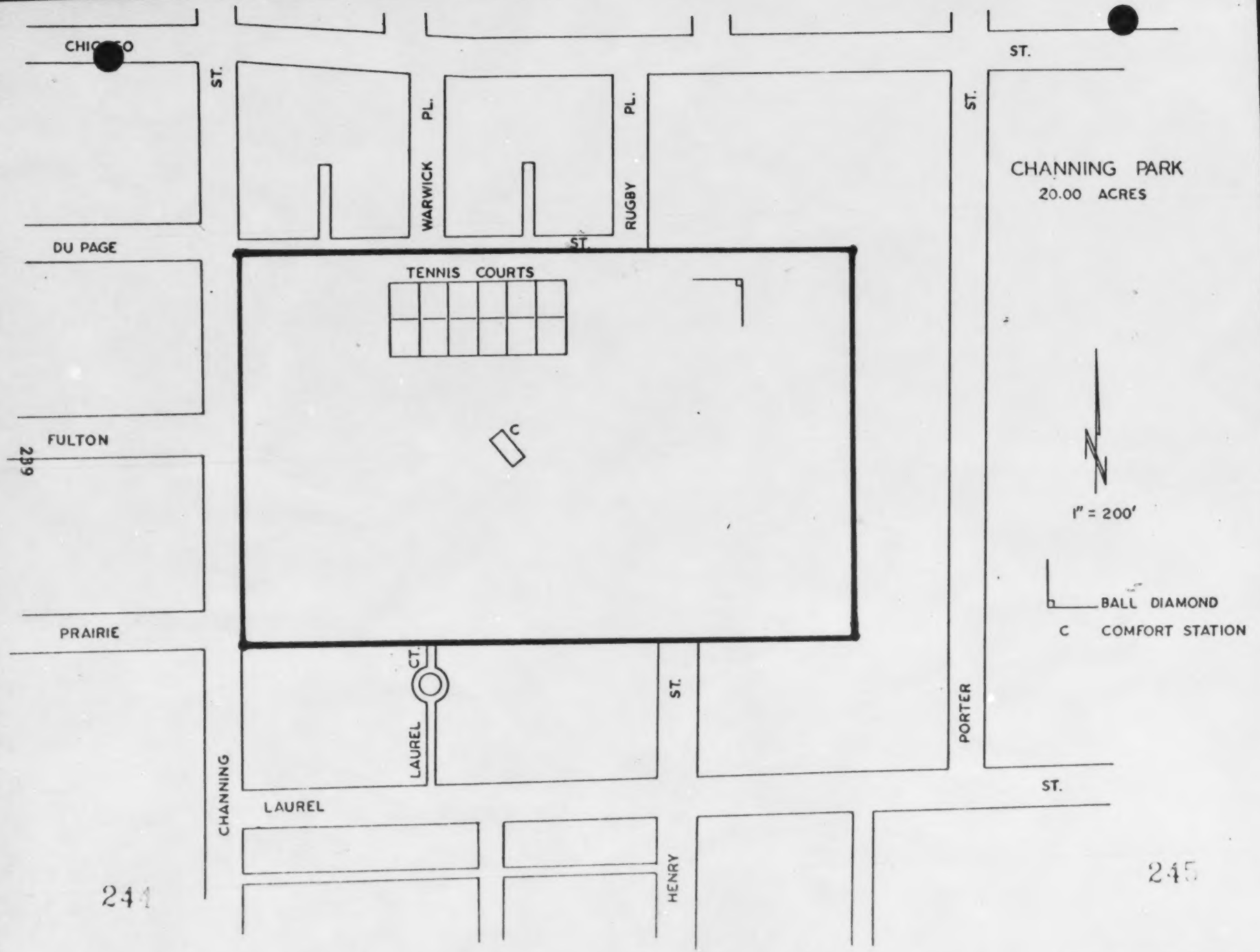
BARCLAY PARK
0.20 ACRE

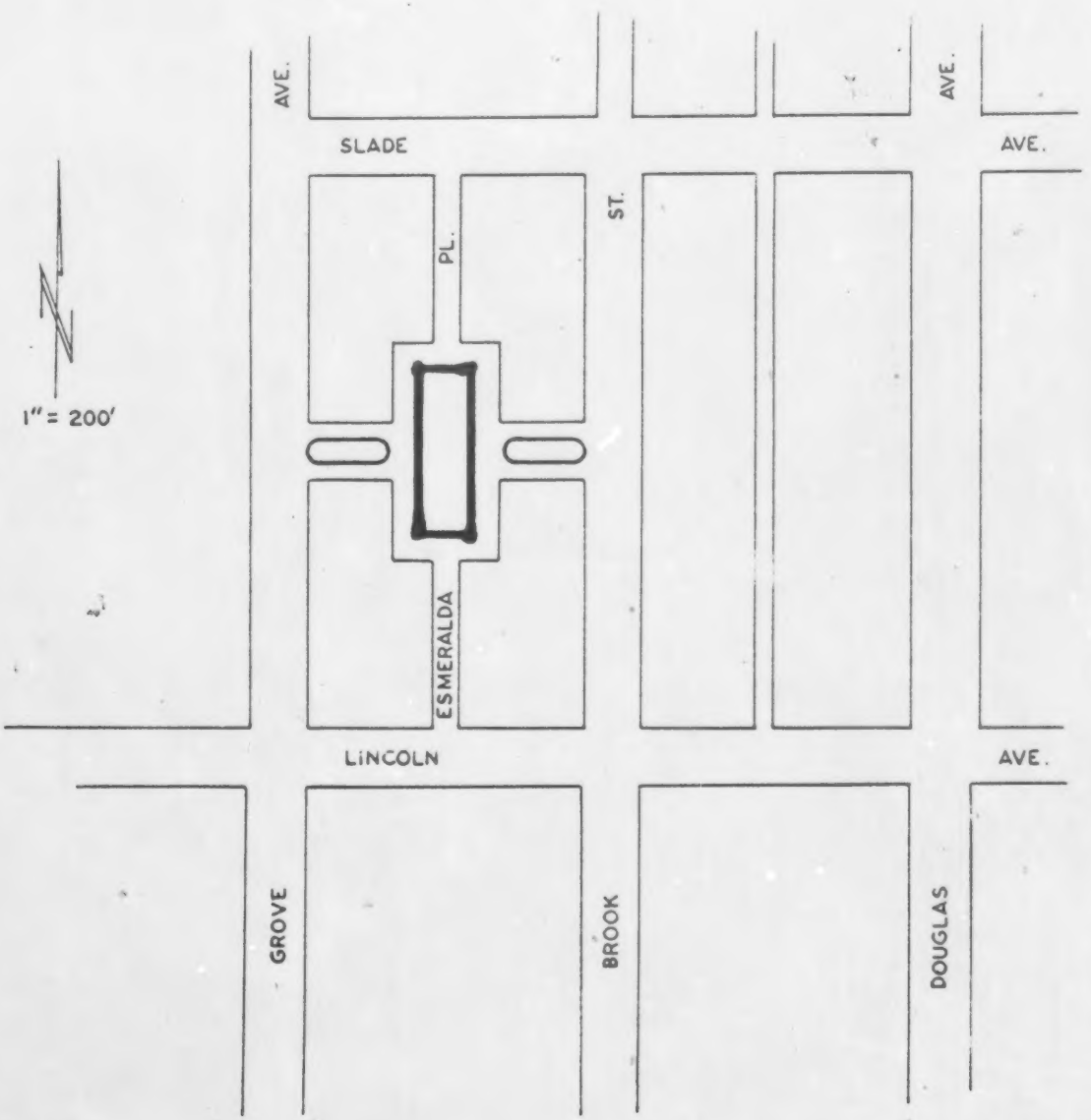


242


CENTRAL PARK
13.00 ACRES
1" = 200'
S SHELTER
C COMFORT STATION
STATE
FOX
RIVER
S
C
HOUSE
STANDISH
CT.
ST.
ST.
ST.
243

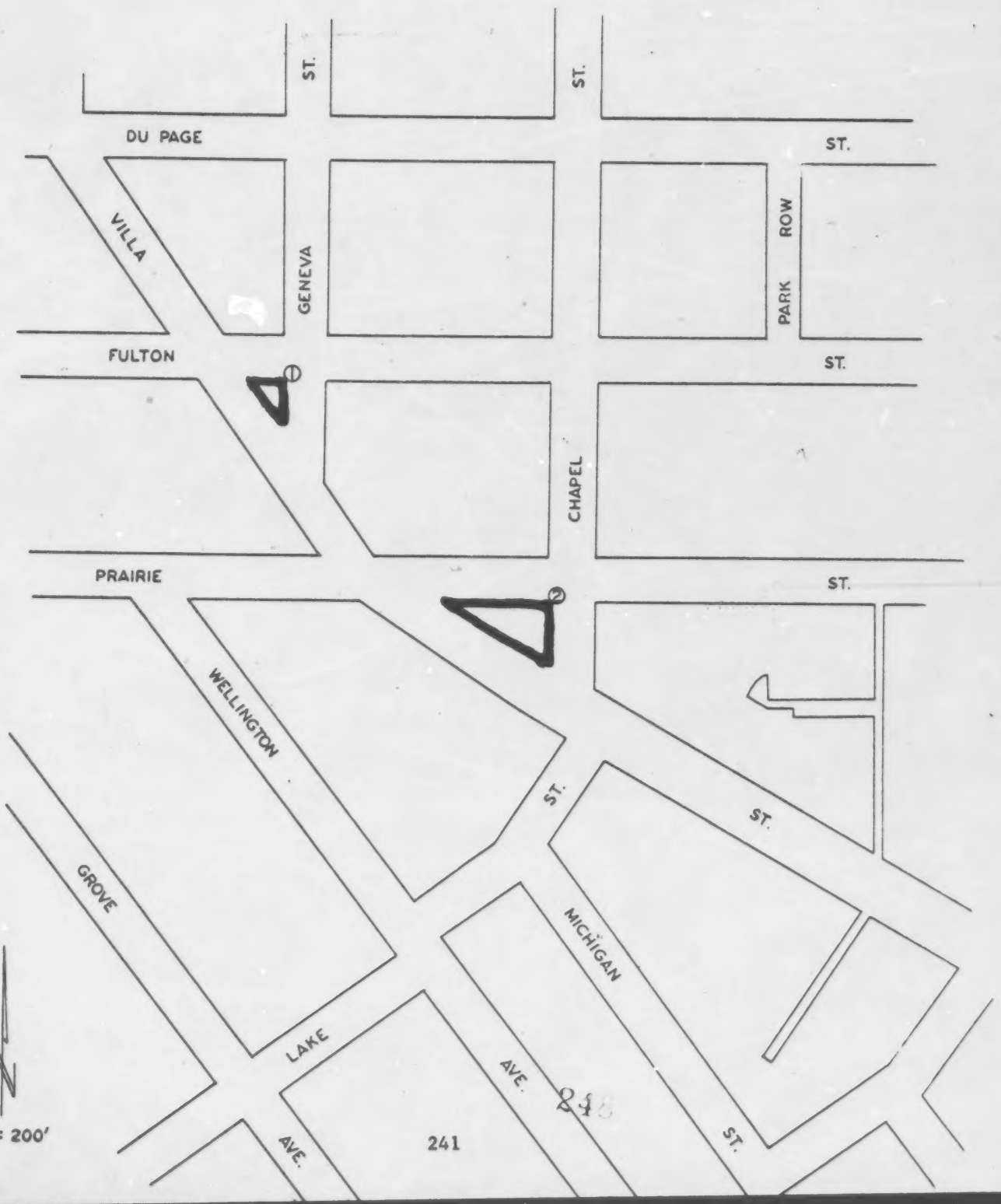

CHICAGO ST.
ST.
WARWICK PL.
RUGBY PL.
ST.
CHANNING PARK
20.00 ACRES
DU PAGE
TENNIS COURTS
ST.
FULTON
289
C
1" = 200'
BALL DIAMOND
C COMFORT STATION
PRAIRIE
CT.
LAUREL
ST.
PORTER
ST.
CHANNING
LAUREL
HENRY
241
245

ESMERALDA PARK
0.20 ACRE



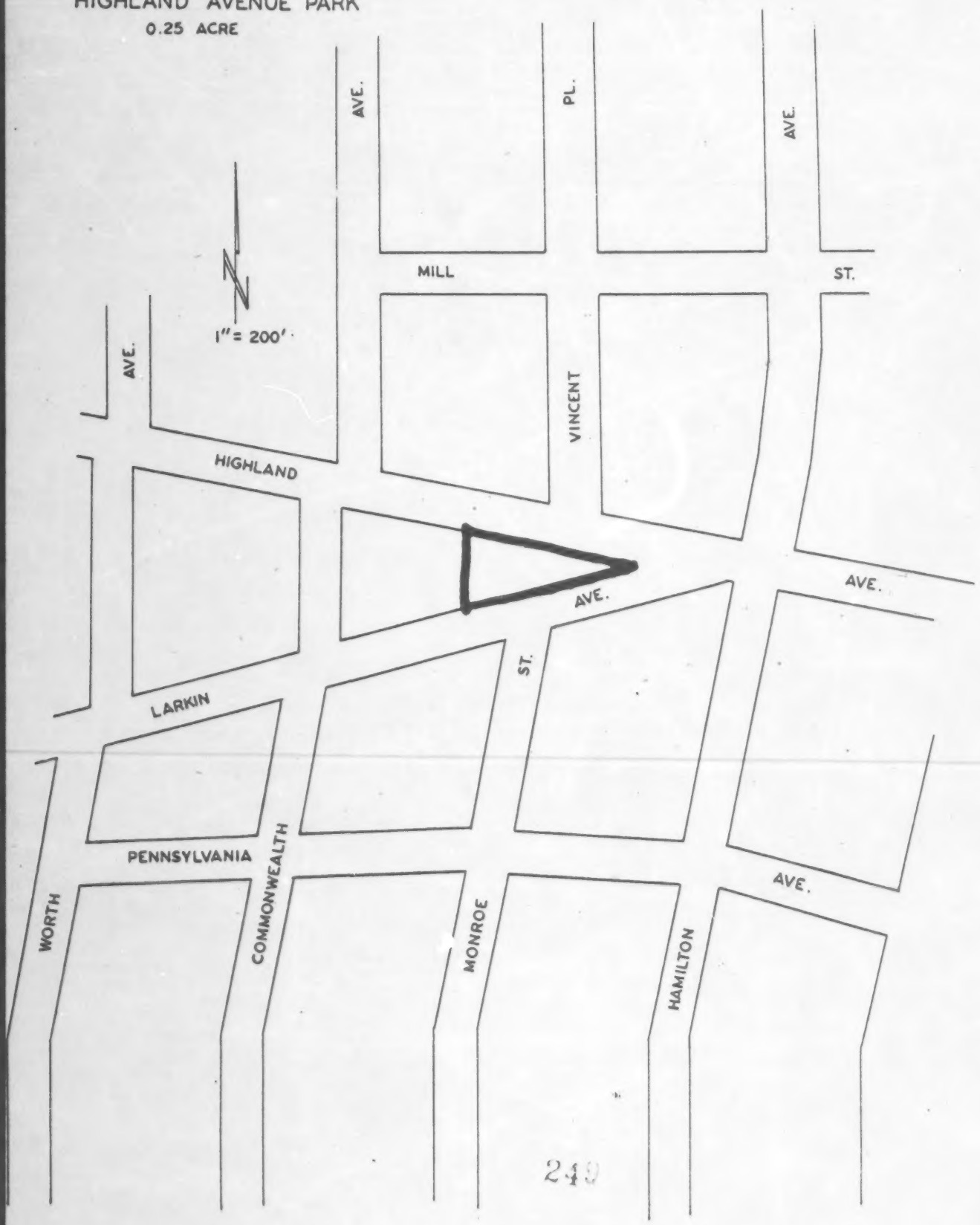
① G.A.R. PARK (GRAND ARMY OF THE REPUBLIC)
0.02 ACRE

② MEMORIAL PARK
0.20 ACRE



HIGHLAND AVENUE PARK

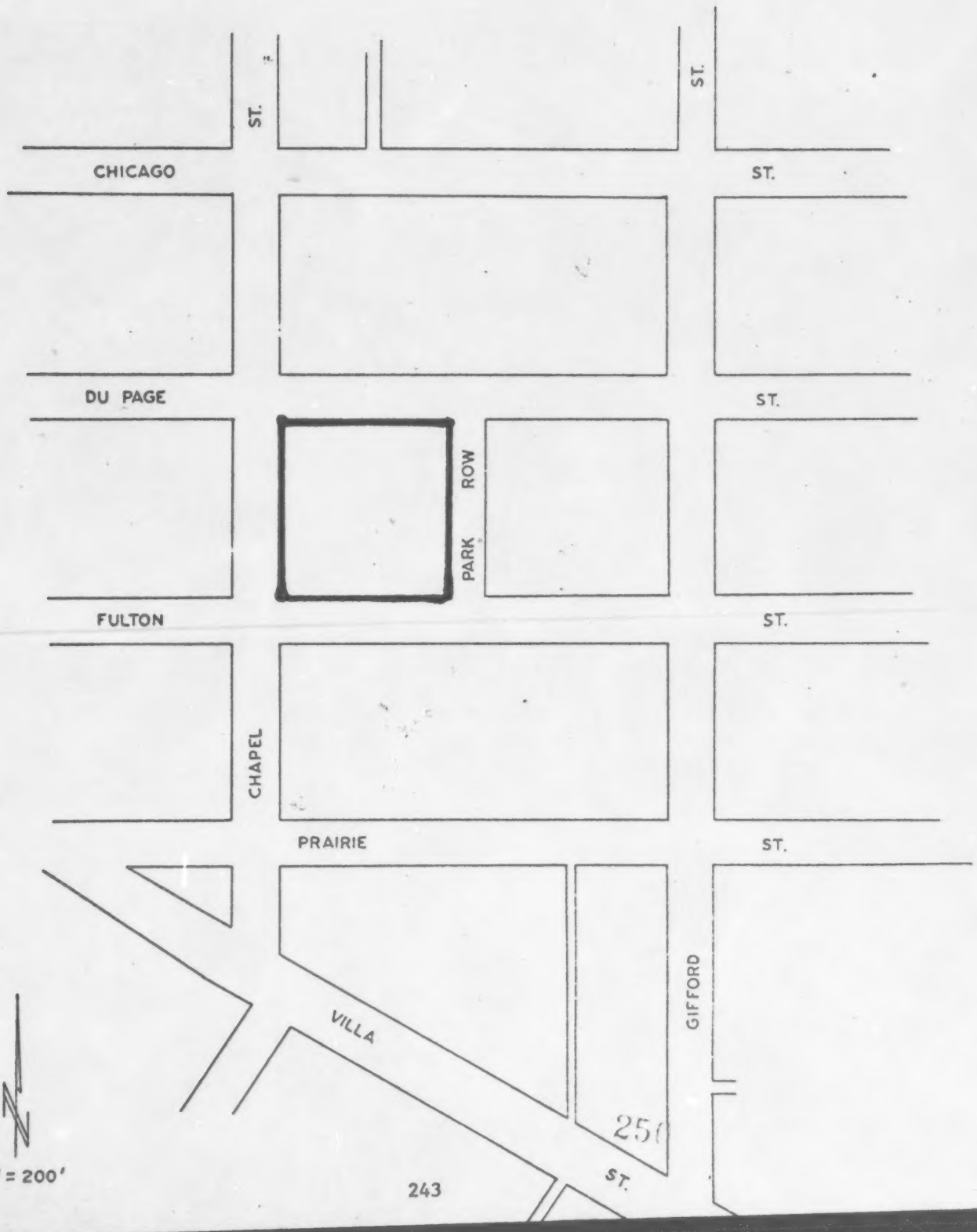
0.25 ACRE



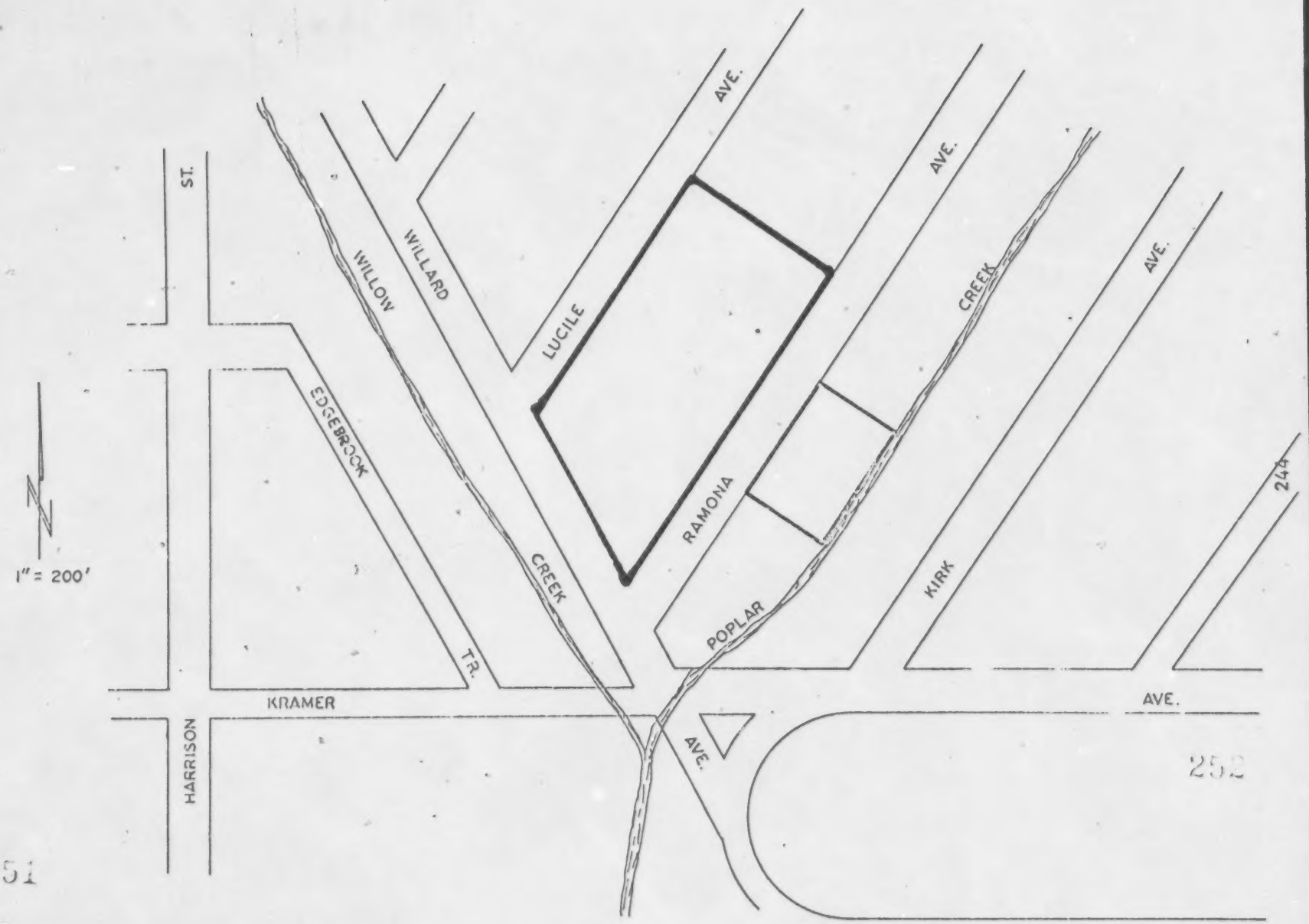
249

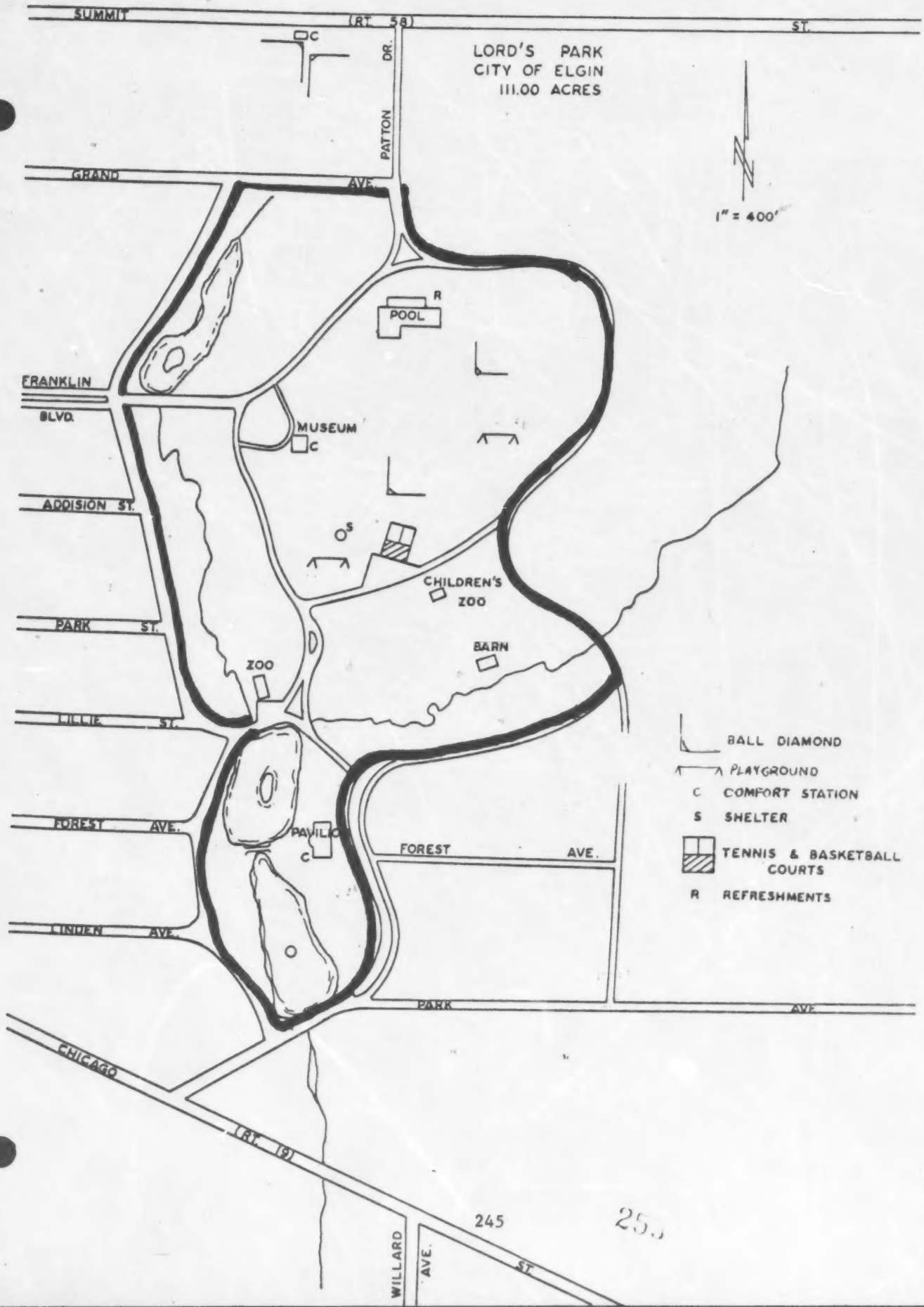
HIGH SCHOOL PARK (PUBLIC SQUARE)

1.00 ACRE

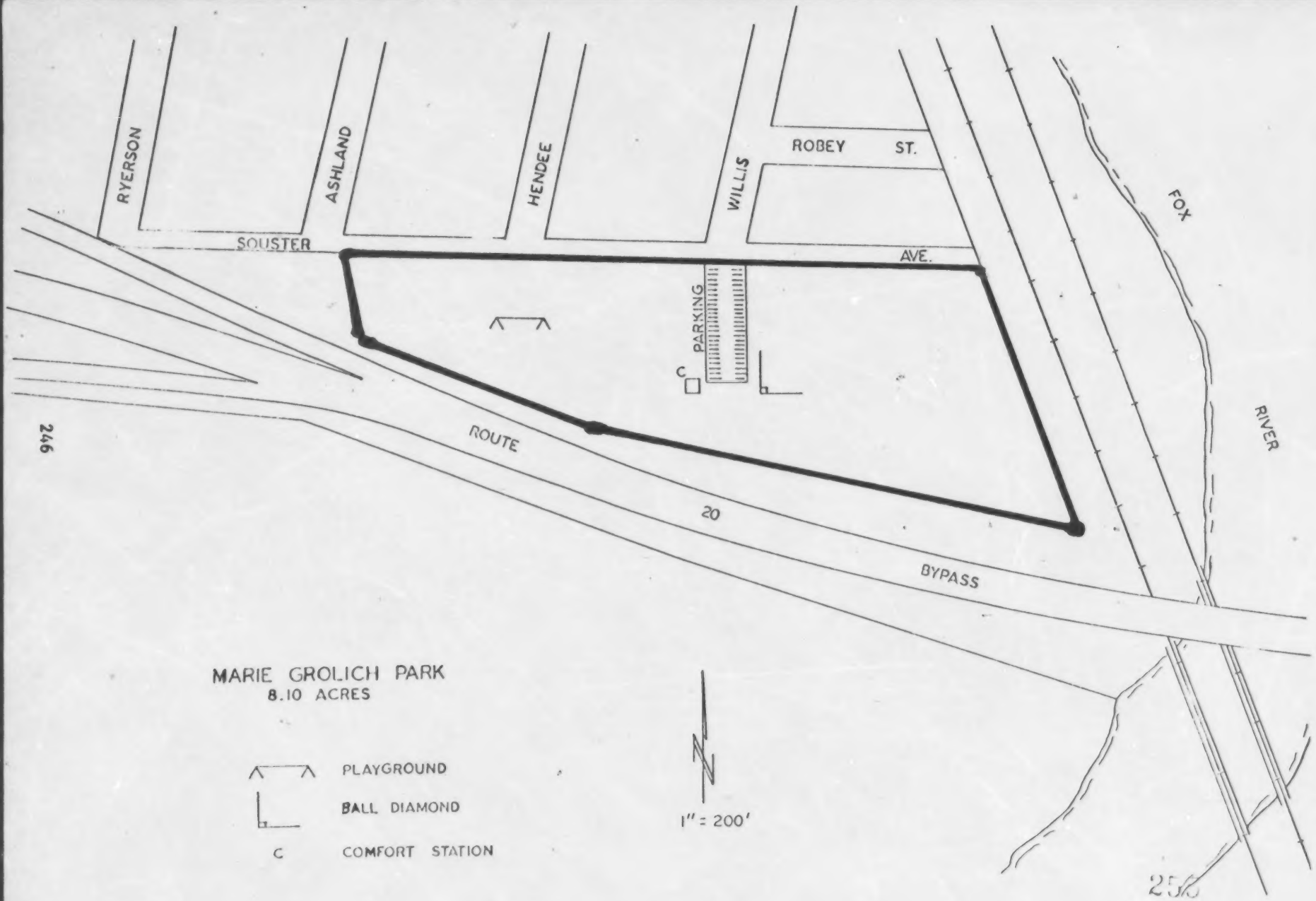


KIWANIS PARK
2.79 ACRES



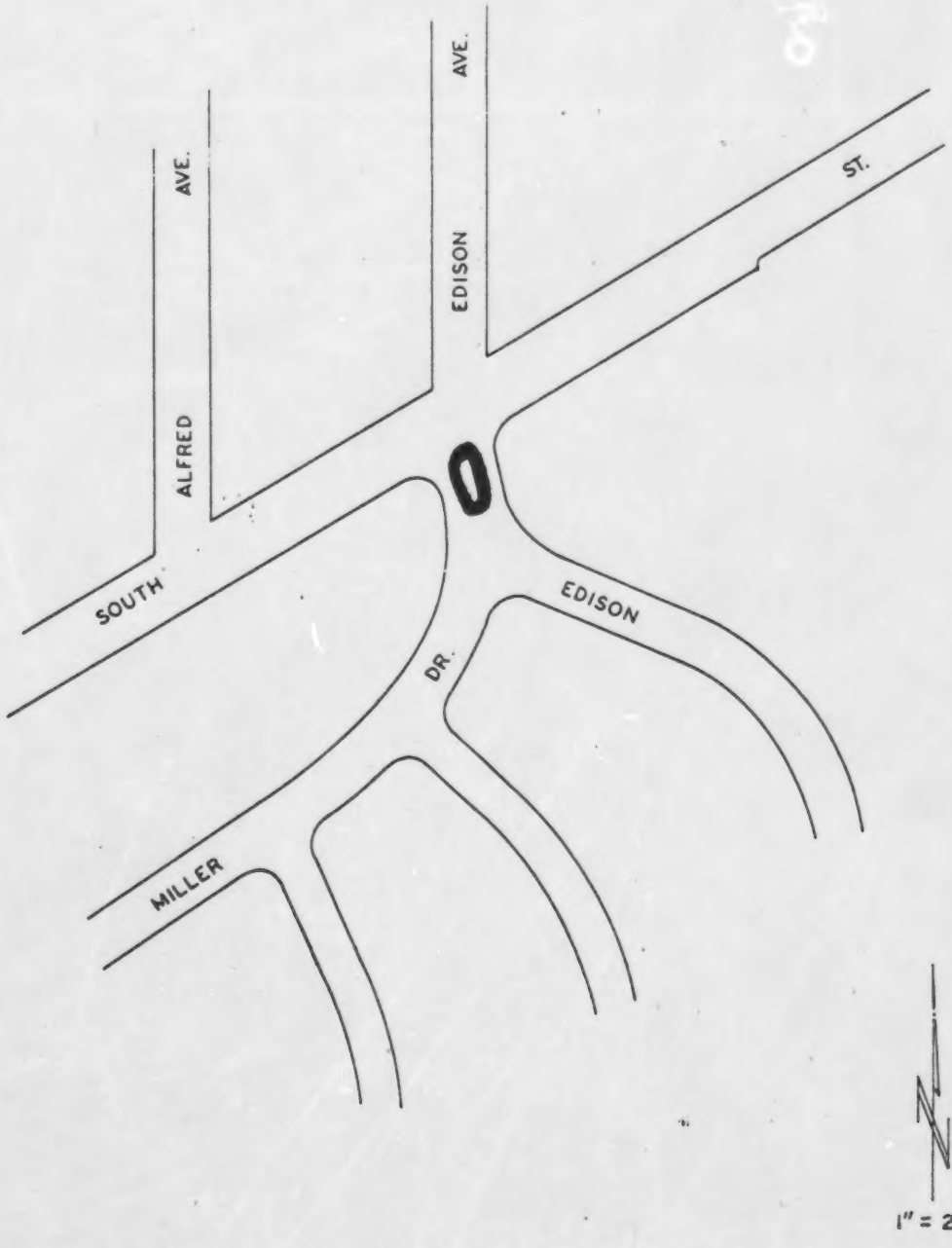

LORD'S PARK
CITY OF ELGIN
111.00 ACRES
1" = 400'
SUMMIT (RT. 58) ST.
PATTON DR.
GRAND AVE.
FRANKLIN BLVD.
ADDISION ST.
PARK ST.
LILLIE ST.
FOREST AVE.
LINDEN AVE.
CHICAGO (RT. 19)
WILLARD AVE.
ST.
PARK AVE.
FOREST AVE.
POOL
R
MUSEUM
C
S
CHILDREN'S ZOO
BARN
ZOO
PAVILION
C
BALL DIAMOND
PLAYGROUND
C COMFORT STATION
S SHELTER
TENNIS & BASKETBALL COURTS
R REFRESHMENTS

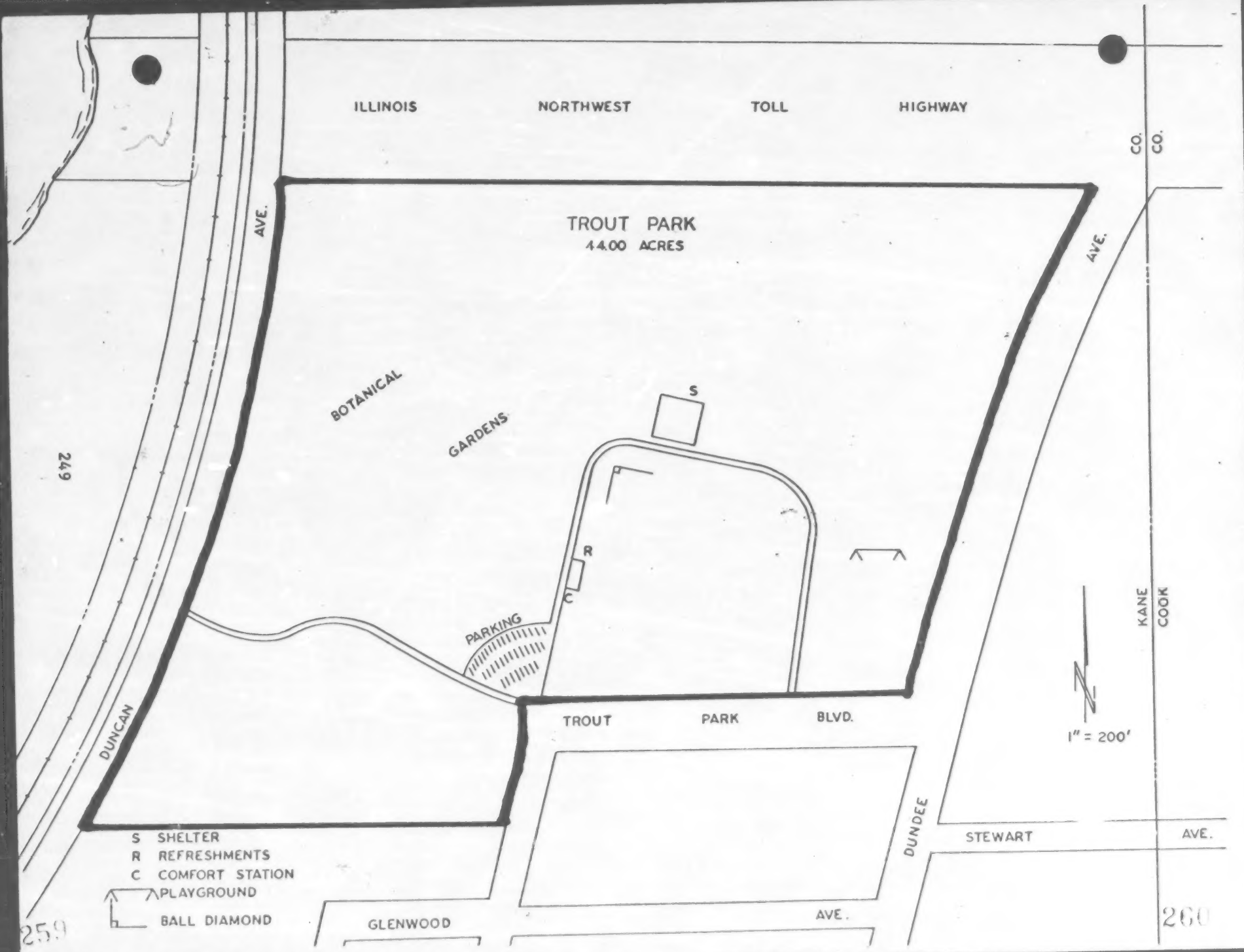
25.

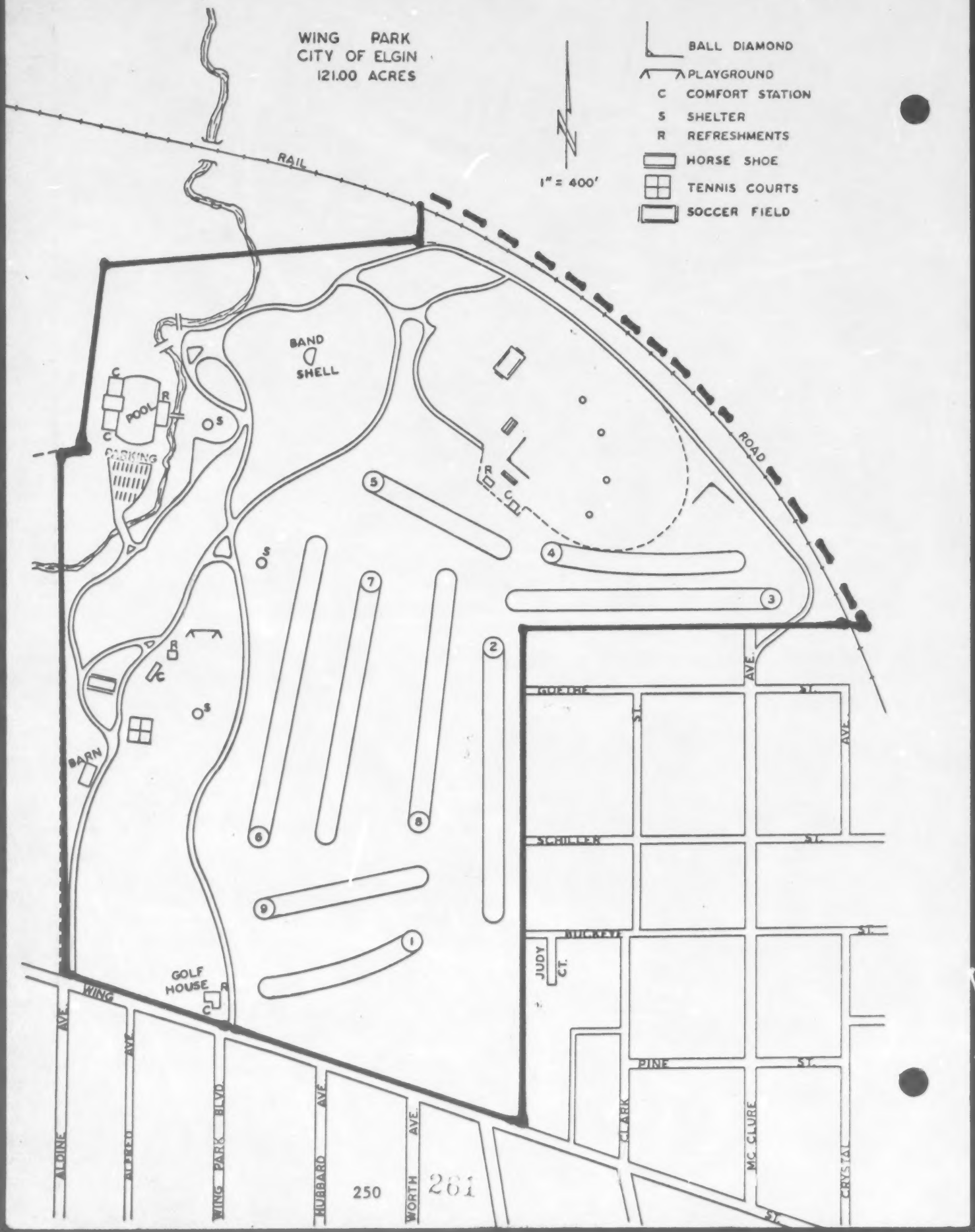

RYERSON
ASHLAND
HENDEE
WILLIS
ROBEY ST.
FOX
SOUSTER AVE.
PARKING
C
246
ROUTE
20
BYPASS
RIVER
MARIE GROLICH PARK
8.10 ACRES
PLAYGROUND
BALL DIAMOND
C COMFORT STATION
1" = 200'

SOUTH STATE PARK
1.50 ACRES

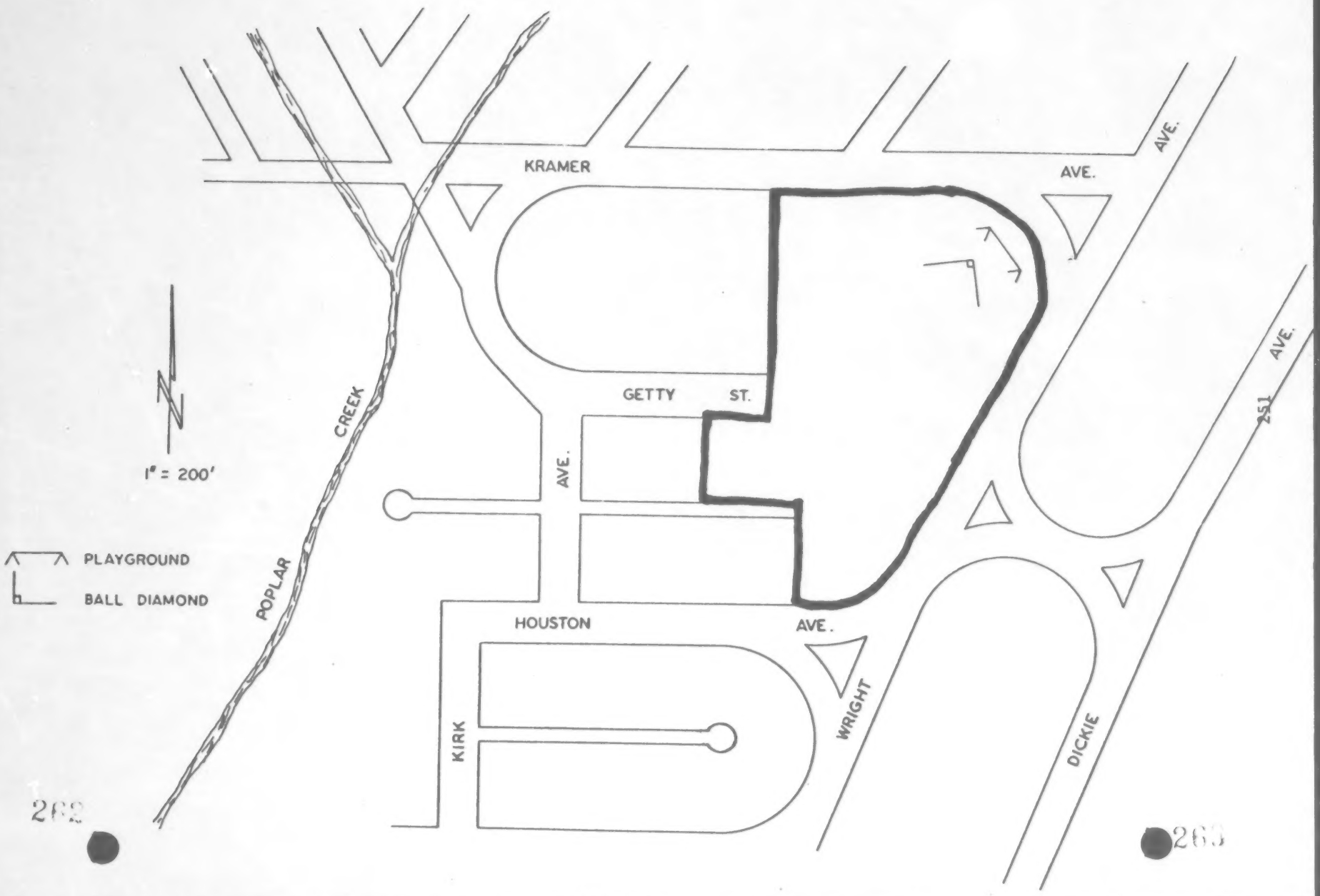
SUNSET PARK
0.01 ACRES




ILLINOIS NORTHWEST TOLL HIGHWAY
CO.
CO.
TROUT PARK
44.00 ACRES
AVE.
AVE.
BOTANICAL
GARDENS
S
R
C
PARKING
249
DUNCAN
TROUT PARK BLVD.
KANE
COOK
1" = 200'
DUNDEE
STEWART AVE.
GLENWOOD AVE.
S SHELTER
R REFRESHMENTS
C COMFORT STATION
PLAYGROUND
BALL DIAMOND


WING PARK
CITY OF ELGIN
121.00 ACRES
1" = 400'
BALL DIAMOND
PLAYGROUND
C COMFORT STATION
S SHELTER
R REFRESHMENTS
HORSE SHOE
TENNIS COURTS
SOCCER FIELD
RAIL
ROAD
BAND SHELL
POOL
PARKING
BARN
GOLF HOUSE
WING
GOETHE ST.
SCHILLER ST.
BUCKEYE ST.
PINE ST.
JUDY CT.
CLARK
MC CLURE
CRYSTAL
ALDINE AVE.
ALFRED AVE.
WING PARK BLVD.
HUBBARD AVE.
WORTH AVE.
1
2
3
4
5
6
7
8
9

WRIGHT AVENUE PARK
3.85 ACRES



Retain in Folder - Retyped here

3. Display snapshots of children in class to show changes in growth.

Concept C MAN HAS A RESPONSIBILITY TO PRESERVE WILDLIFE

Activities:

1. Prepare feeding stations for birds and squirrels. In schools where materials are available maybe a photo album or even a movie of the animals using these stations could be made.
2. Visit a game preserve (McGraw Wildlife).
3. Improve a wildlife habitat by planting food and shelter plants.
4. Invite a game warden or equivalent to explain laws, stocking fish, habitat improvement, and other wildlife practices.
5. List nearby state parks and reserves. Encourage children to visit them. A field trip might be possible.
6. Visit a body of polluted water (Fox River) and explain how some pollutants endanger the life of many animals.
7. Have the children do research on local garbage laws. Then have the janitor come in and explain how trash is disposed of at your school.
8. Visit a local farm and have the farmer show and explain the number of chickens hatched each year versus the number of calves born each year. Relate this to the state laws regulating the number of larger animals killed each year versus the number of smaller animals.

Example: one deer per year per license, five squirrels per day, five rabits per day. Deer season lasts approximately three and one-half months. It is therefore possible to kill many more rabbits and squirrels than deer. Why is this so? Why do we have laws regulating the number and time of year that wildlife can be killed?

9. To add to the unit on man's responsibility to wildlife, relate this to environment and have a clean-up campaign in and around the school grounds.